

Description

The present invention relates to an optical filter tuning apparatus and optical filtering method.

In order to filter light emitted from an optical fibre a chirped dichromated gelatin (DCG) filter may be used. A filter of this type is described in a paper entitled "Position - tunable holographic filters in dichromated gelatin for use in single - mode - fiber demultiplexers", Optical Letters, Vol. 10, page 303, June 1985. Light is normally directed from an input optical fibre onto the chirped grating filter using a lens arrangement. As the filter is a chirped grating the wavelength of light reflected therefrom is dependent on the position of incidence of the light from the input fibre. To adjust the filtering characteristics of this filter arrangement, which is described in detail hereinafter, the filter must be moved relative to the lens and input fibre so as to alter the position of incidence. To effect this adjustment regard must be had to very stringent angular tolerances in two planes. The restrictions imposed by the tolerances necessitate the use of an elaborate and expensive support mechanism on which the filter arrangement must be mounted. Hence, it is desirable to provide a filter apparatus and filtering method which reduces the angular tolerances that must be met.

In accordance with the present invention there is provided an optical filter tuning apparatus comprising:
an optical filter which reflects light of a predetermined wavelength, said wavelength being determined by the position of incidence of said light on said filter;

characterised in that there is provided a retro-reflector moveable relative to said filter to reflect light from an optical source to said position of incidence on said filter and reflect light of said predetermined wavelength to optical receiving means;

said position of incidence and said predetermined wavelength being adjustable by moving said retroreflector with respect to said filter.

In accordance with the present invention there is also provided an optical filtering method characterised by;

reflecting light to be filtered from an optical source onto an optical filter using a retroreflector, the wavelength of light reflected from said filter being dependent on the position of incidence of light on said filter and said retroreflector being moveable relative to said filter so as to adjust said position of incidence; and

reflecting said reflected light of said predetermined wavelength to optical receiving means using said retroreflector.

Preferred embodiments of the present invention will now be described, by one example only, with reference to the accompanying drawings wherein:

Figure 1 is a schematic diagram of a known filter

arrangement;

Figure 2 is a schematic diagram of a first preferred embodiment of a filter tuning apparatus according to the present invention tuned to a short wavelength;

Figure 3 a schematic diagram of the apparatus of Figure 2 tuned to a long wavelength;

Figure 4 is a plan schematic view of a second preferred embodiment of a filter tuning apparatus according to the present invention;

Figure 5 is side schematic view of the apparatus of Figure 4;

and Figure 6 is an end schematic view of the apparatus of Figure 4.

A known optical filter arrangement 2, as shown in Figure 1, includes an input optical fibre 4 and an output optical fibre 6, a chirped grating dichromated gelatin (DCG) filter 8 and a lens 10 disposed between the fibres 4 and 6 and the filter 8. The input optical fibre carries light 12 to be filtered which is emitted from the end 14 of the input fibre 4 and directed onto the filter 8 by the lens 10. The relative positions of the input fibre 4, the lens 10 and the filter 8 determines the point of incidence 16 of the light 12 on the filter 8.

The filter arrangement 2 further includes an output optical fibre 6 which is aligned with and parallel to the input fibre 4. The output fibre 6 is used to receive light 18 reflected from the filter 8. The reflected light 18 is directed into the output fibre 6 by the lens 10. The wavelength of the reflected light 18 is dependent on the position of the point of incidence 16. By moving the filter 8 with respect to the lens 10 in one of the directions indicated by the arrows 20 and 22, without altering the lateral distance between the lens 10 and the filter 8, the point of incidence 16 of the light 12 on the filter 8 is altered and the wavelength of the reflected light 18 is adjusted correspondingly. Thus, the filtering characteristics of the filter arrangement 2 can be adjusted or tuned as desired due to the inherent properties of the chirped grating DCG filter 8.

The filter arrangement 2 is mounted on a support mechanism (not shown) which ensures the relative positions of the fibres 4 and 6, lens 10 and filter 8 are maintained and during tuning of the arrangement 2 only movement of the filter 8 in the directions indicated by the arrows 20 and 22 is permitted. Generally, the mechanism provides for a 40 to 80mm movement of the filter 8. The support mechanism is, however, normally elaborate and expensive as movement of the filter 8 must be performed within very stringent angular tolerances. The tolerances are with respect to the angles of incidence and reflection for the incident light 12 and reflected light 18 with respect to the lens 10 and the filter 8. For example, if the input and output fibres 4 and 6 are multimode fibres having a core diameter of 50 μm and the lens has a focal length of 5mm with respect to the fibres 4 and 6, the angles of

incidence and reflection cannot vary by more than 0.1° . If single mode fibre, having a core diameter of $8\text{ }\mu\text{m}$, is used instead the angular tolerance is about $40''$. The tolerances must be met to ensure the output fibre 6 receives the reflected filtered light 18. The restrictive tolerances are due primarily to the size of the core of the output fibre 6, which generally has a cross-sectional radius of between 4 to $25\text{ }\mu\text{m}$, and the focal length with respect to the lens 10 and fibres 4 and 6, which is usually about 5 mm . The same problem would exist if other optical waveguides of similar size, such as silica waveguides, were used instead of fibres 4 and 6.

An optical filter tuning apparatus 30, as shown in Figure 2, is similar to the filter arrangement 2 described previously in that it includes input and output fibres 4 and 6, a lens 10, and a chirped grating DCG filter 8. The tuning apparatus 30, however, further includes a retroreflector 32 and the lens 10 is disposed adjacent an end of the filter 8 and is also substantially coplanar therewith. The retroreflector 32 is a device which comprises three mirrors or prism facets which are joined together so as to be precisely orthogonal with respect to one another. A typical structure of a retroreflector resembles three sides of a hollow cube having a common vertex, wherein the inner faces of the sides have mirrored surfaces.

The retroreflector 32 is positioned with respect to the lens 10 and filter 8 so as to reflect light 12 from the input fibre 4 onto the filter 8 and reflect filtered light 18 from the filter 8 onto the lens 10 so as to be directed into the output fibre 6. The input and output fibres 4 and 6, the lens 10 and the filter 8 are mounted in fixed positions on a support mechanism (not shown) so that light received by and transmitted from the lens 10 propagates in a direction parallel to the direction of propagation of light received and reflected from the filter 8. This arrangement is possible because light incident on a mirror face of the retroreflector 32 will always be reflected from the retroreflector 32 in a direction which is opposite and parallel (if not colinear) to the direction of incidence. Thus, the tuning apparatus 30 is arranged, as shown in Figures 2 and 3, so that the light 12 to be filtered travels on approximately the same path as the filtered light 18 reflected from the filter 8 and the angles of incidence and reflection associated with the filter 8 are approximately 90° . A slight difference in the path of travel, however, is induced by slightly angling the filter 8 so as to enable the filtered light 18 to be directed by the lens 10 into output fibre 6 instead of the input fibre 4.

The filter tuning apparatus 30 as illustrated in Figure 2, is tuned so as to filter for light of a short wavelength. In order to perform a filtering operation for light of a longer wavelength the position of the point of incidence 16 must be moved and this is achieved by moving the vertex 35 of the retroreflector 32 horizontally with respect to the lens 10 and the filter 8, in

the direction of the arrow 36 to the position shown in Figure 3. There are no restrictive tolerances associated with adjusting or tuning the apparatus 30 because only movement of retroreflector 32 needs to be effected. Due to the inherent reflection properties of the retroreflector 32, as discussed previously, the retroreflector 32 may be tilted, rotated and even moved 1 to 2 mm vertically without affecting the parallel relationship with respect to the paths of the light received and emitted from the lens 10 and the light received and reflected by the filter 8. Hence, the filter tuning apparatus 30 may be mounted on a relatively inexpensive support structure and alignment mechanism. The optical path length from the lens 10 to the filter 8 is the same for each selected point of incidence 16 and the wavelength of the reflected light 18 selected is dependent only on the position of the retroreflector vertex 35. Also, for a given chirp rate, the movement of the retroreflector 32 required to alter the selected wavelength is approximately half of what would be required to cover the same wavelength range if either the filter 8 or the lens 10 and fibres 4 and 6 were to be moved.

An alternative and more compact arrangement of the filter tuning apparatus 30 is illustrated in Figures 4 to 6. In this arrangement instead of placing the lens 10 and input and output fibres 4 and 6 adjacent one end of the filter 8, the lens and fibre assembly is positioned adjacent to one side of the filter 8, as is best shown in Figure 4. Adjusting the wavelength of filtered light is still achieved by moving the vertex 35 of the retroreflector 32 horizontally with respect to the remaining parts of the apparatus 30. The retroreflector 32 is moved along a path indicated by the double headed arrow 40, which results in movement of the point of incidence 16 along a parallel path 42. The particular advantage of this more compact arrangement is that due to relative positions of the fixed filter 8 and lens 10 and fibres 4 and 6 the diameter of the retroreflector 32 can be reduced by approximately one half.

The tuning apparatus 30 is amenable to a further development and use in other applications, for example, two-dimensional movement of the retroreflector 32 may be used to allow light to be selectively reflected onto one of several filters 8 which each cover a different wavelength range. Also, a single source, such as a laser, may transmit light to and receive light from the filter 8. A single fibre may also be used as the input and output fibres 4 and 6.

Claims

1. An optical filter tuning apparatus comprising:
an optical filter (8) which reflects light of a predetermined wavelength, said wavelength being determined by the position of incidence of



incidence and reflection cannot vary by more than 0.1°. If single mode fibre, having a core diameter of 8 µm, is used instead the angular tolerance is about 40°. The tolerances must be met to ensure the output fibre 6 receives the reflected filtered light 18. The restrictive tolerances are due primarily to the size of the core of the output fibre 6, which generally has a cross-sectional radius of between 4 to 25 µm, and the focal length with respect to the lens 10 and fibres 4 and 6, which is usually about 5 mm. The same problem would exist if other optical waveguides of similar size, such as silica waveguides, were used instead of fibres 4 and 6.

An optical filter tuning apparatus 30, as shown in Figure 2, is similar to the filter arrangement 2 described previously in that it includes input and output fibres 4 and 6, a lens 10, and a chirped grating DCG filter 8. The tuning apparatus 30, however, further includes a retroreflector 32 and the lens 10 is disposed adjacent an end of the filter 8 and is also substantially coplanar therewith. The retroreflector 32 is a device which comprises three mirrors or prism facets which are joined together so as to be precisely orthogonal with respect to one another. A typical structure of a retroreflector resembles three sides of a hollow cube having a common vertex, wherein the inner faces of the sides have mirrored surfaces.

The retroreflector 32 is positioned with respect to the lens 10 and filter 8 so as to reflect light 12 from the input fibre 4 onto the filter 8 and reflect filtered light 18 from the filter 8 onto the lens 10 so as to be directed into the output fibre 6. The input and output fibres 4 and 6, the lens 10 and the filter 8 are mounted in fixed positions on a support mechanism (not shown) so that light received by and transmitted from the lens 10 propagates in a direction parallel to the direction of propagation of light received and reflected from the filter 8. This arrangement is possible because light incident on a mirror face of the retroreflector 32 will always be reflected from the retroreflector 32 in a direction which is opposite and parallel (if not colinear) to the direction of incidence. Thus, the tuning apparatus 30 is arranged, as shown in Figures 2 and 3, so that the light 12 to be filtered travels on approximately the same path as the filtered light 18 reflected from the filter 8 and the angles of incidence and reflection associated with the filter 8 are approximately 90°. A slight difference in the path of travel, however, is induced by slightly angling the filter 8 so as to enable the filtered light 18 to be directed by the lens 10 into output fibre 6 instead of the input fibre 4.

The filter tuning apparatus 30 as illustrated in Figure 2, is tuned so as to filter for light of a short wavelength. In order to perform a filtering operation for light of a longer wavelength the position of the point of incidence 16 must be moved and this is achieved by moving the vertex 35 of the retroreflector 32 horizontally with respect to the lens 10 and the filter 8, in

the direction of the arrow 36 to the position shown in Figure 3. There are no restrictive tolerances associated with adjusting or tuning the apparatus 30 because only movement of retroreflector 32 needs to be effected. Due to the inherent reflection properties of the retroreflector 32, as discussed previously, the retroreflector 32 may be tilted, rotated and even moved 1 to 2 mm vertically without affecting the parallel relationship with respect to the paths of the light received and emitted from the lens 10 and the light received and reflected by the filter 8. Hence, the filter tuning apparatus 30 may be mounted on a relatively inexpensive support structure and alignment mechanism. The optical path length from the lens 10 to the filter 8 is the same for each selected point of incidence 16 and the wavelength of the reflected light 18 selected is dependent only on the position of the retroreflector vertex 35. Also, for a given chirp rate, the movement of the retroreflector 32 required to alter the selected wavelength is approximately half of what would be required to cover the same wavelength range if either the filter 8 or the lens 10 and fibres 4 and 6 were to be moved.

An alternative and more compact arrangement of the filter tuning apparatus 30 is illustrated in Figures 4 to 6. In this arrangement instead of placing the lens 10 and input and output fibres 4 and 6 adjacent one end of the filter 8, the lens and fibre assembly is positioned adjacent to one side of the filter 8, as is best shown in Figure 4. Adjusting the wavelength of filtered light is still achieved by moving the vertex 35 of the retroreflector 32 horizontally with respect to the remaining parts of the apparatus 30. The retroreflector 32 is moved along a path indicated by the double headed arrow 40, which results in movement of the point of incidence 16 along a parallel path 42. The particular advantage of this more compact arrangement is that due to relative positions of the fixed filter 8 and lens 10 and fibres 4 and 6 the diameter of the retroreflector 32 can be reduced by approximately one half.

The tuning apparatus 30 is amenable to a further development and use in other applications, for example, two-dimensional movement of the retroreflector 32 may be used to allow light to be selectively reflected onto one of several filters 8 which each cover a different wavelength range. Also, a single source, such as a laser, may transmit light to and receive light from the filter 8. A single fibre may also be used as the input and output fibres 4 and 6.

Claims

1. An optical filter tuning apparatus comprising:
an optical filter (8) which reflects light of a predetermined wavelength, said wavelength being determined by the position of incidence of



- said light on said filter;
characterised in that there is provided a retroreflector (32) moveable relative to said filter to reflect light from an optical source (4,10) to said position of incidence on said filter and reflect light of said predetermined wavelength to optical receiving means (6,10);
said position of incidence and said predetermined wavelength being adjustable by moving said retroreflector with respect to said filter.
2. An optical filter tuning apparatus as claimed in claim 1, characterised by lens means (10) to direct light from said source onto said retroreflector and direct filtered light from said retroreflector to said receiving means, said lens means and said optical filter being positionally fixed with respect to one another.
 3. An optical filter tuning apparatus as claimed in claim 2, characterised in that said filter and said lens means lie substantially in a first plane and said retroreflector is moveable such that the vertex of said retroreflector is moveable in a second plane substantially parallel to said first plane.
 4. An optical filter tuning apparatus as claimed in any one of the preceding claims characterised in that light incident on and filtered light reflected from said filter travel along substantially the same path.
 5. An optical filter tuning apparatus as claimed in any one of the preceding claims characterised in that said filter is a chirped grating dichromated gelatin (DCG) filter.
 6. An optical filter tuning apparatus as claimed in any one of the preceding claims characterised in that said source serves also as said receiving means.
 7. An optical filter tuning apparatus as claimed in any one of the preceding claims, characterised in that said source and said receiving means are input (4) and output (6) optical fibres, respectively.
 8. An optical filtering method characterised by;
reflecting light to be filtered from an optical source (4,10) onto an optical filter (8) using a retroreflector (32), the wavelength of light reflected from said filter being dependent on the position of incidence of light on said filter and said retroreflector being moveable relative to said filter so as to adjust said position of incidence; and
reflecting said reflected light of said predetermined wavelength to optical receiving means (6,10) using said retroreflector.
 9. An optical filtering method as claimed in claim 8, characterised by directing light from said source onto said retroreflector and directing filtered light to said receiving means, using lens means (10), said lens means and said optical filter being positionally fixed with respect to one another.
 10. An optical filtering method as claimed in claim 9, characterised by adjusting said position of incidence and said predetermined wavelength by moving the vertex of said retroreflector in a first plane substantially parallel to a second plane in which said lens means and said filter substantially lie.
 11. An optical filtering method as claimed in any one of claims 8 to 10, characterised in that light incident on and filtered light reflected from said filter travel along substantially the same path.
 12. An optical filtering method as claimed in any one of Claims 8 to 11, characterised in that said filter is a chirped grating dichromated gelatin (DCG) filter.
 13. An optical filtering method as claimed in any one of Claims 8 to 12, wherein said source serves also as said receiving means.
 14. An optical filtering method as claimed in any one of claims 8 to 13, characterised in that said source and said receiving means are input and output optical fibres, respectively.

Patentansprüche

1. Gerät zum Abstimmen eines optischen Filters mit einem optischen Filter (8) das Licht einer vorbestimmten Wellenlänge reflektiert, wobei die Wellenlänge durch die Einfallposition des Lichtes auf das Filter bestimmt wird;
dadurch gekennzeichnet, daß ein Retroreflektor (32) vorgesehen ist, der relativ zum Filter beweglich ist, um Licht aus einer optischen Quelle (4, 10) auf die Einfallposition des Filters zu reflektieren und um Licht der vorbestimmten Wellenlänge auf optische Empfangseinrichtungen (6, 10) zu reflektieren;
wobei die Einfallposition und die vorbestimmte Wellenlänge durch Bewegen des Retroreflektors relativ zum Filter einstellbar sind.
2. Gerät zum Abstimmen eines optischen Filters nach Anspruch 1, gekennzeichnet durch ein Linsenelement (10) zum Richten des von der Quelle ausgehenden Lichtes auf den Retroreflektor und zum Richten des vom Retroreflektor ausgehen-



den gefilterten Lichtes auf die Empfangsmittel, wobei das Linsenelement und das optische Filter in ihrer Position relativ zueinander fixiert sind.

3. Gerät zum Abstimmen eines optischen Filters nach Anspruch 2, dadurch gekennzeichnet, daß das Filter und das Linsenelement im wesentlichen in einer ersten Ebene liegen, daß der Retroreflektor so beweglich ist, daß der Scheitelpunkt des Retroreflektors in einer zweiten Ebene beweglich ist, die im wesentlichen parallel zur ersten Ebene verläuft.
4. Gerät zum Abstimmen eines optischen Filters nach einem beliebigen vorhergehenden Anspruch, dadurch gekennzeichnet, daß auf das Filter einfallende Licht und das vom Filter reflektierte gefilterte Licht im wesentlichen entlang desselben Pfades läuft.
5. Gerät zum Abstimmen eines optischen Filters nach einem beliebigen vorhergehenden Anspruch, dadurch gekennzeichnet, daß das Filter ein dichromatisches Gelatinefilter (DCG) mit Chirp-Gitter ist.
6. Gerät zum Abstimmen eines optischen Filters nach einem beliebigen vorhergehenden Anspruch, dadurch gekennzeichnet, daß die Quelle auch als Empfangseinrichtung dient.
7. Gerät zum Abstimmen eines optischen Filters nach einem beliebigen vorhergehenden Anspruch dadurch gekennzeichnet, daß die Quelle und die Empfangseinrichtung aus einer Eingangslichtleitfaser (4) bzw. einer Ausgangslichtleitfaser (6) bestehen.
8. Optisches Filterverfahren, gekennzeichnet durch:
Reflektieren von zu filterndem Licht aus einer optischen Quelle (4, 10) auf ein optisches Filter (8) unter Verwendung eines Retroreflektors (32), wobei die Wellenlänge des vom Filter reflektierten Lichtes von der Einfallposition des Lichtes auf dem Filter abhängt und wobei der Retroreflektor zum Einstellen der Einfallposition relativ zum Filter beweglich ist; und
Reflektieren des reflektierten Lichtes der vorbestimmten Wellenlänge auf optische Empfangseinrichtungen (6, 10) unter Verwendung des Retroreflektors.
9. Optisches Filterverfahren nach Anspruch 8, gekennzeichnet durch das Richten des von der Quelle ausgehenden Lichtes auf den Retroreflektor, und das Richten des gefilterten Lichtes auf die Empfangseinrichtungen unter Verwendung

des Linsenelementes (10), wobei das Linsenelement und das optische Filter in ihrer Position relativ zueinander fixiert sind.

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10. Optisches Filterverfahren nach Anspruch 9, gekennzeichnet durch Einstellen der Einfallposition und der vorbestimmten Wellenlänge durch Bewegen des Scheitelpunktes des Retroreflektors in einer ersten Ebene, die im wesentlichen parallel zu einer zweiten Ebene verläuft, in der sich das Linsenelement und das Filter im wesentlichen befinden.

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11. Optisches Filterverfahren nach einem beliebigen Anspruch 8 bis 10, dadurch gekennzeichnet, daß das auf das Filter einfallende Licht und das vom Filter reflektierte Licht entlang im wesentlichen desselben Pfades läuft.

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12. Optisches Filterverfahren nach einem beliebigen Anspruch 8 bis 11, dadurch gekennzeichnet, daß das Filter ein dichromatisches Gelatinefilter (DCG) mit Chirp-Gitter ist.

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13. Optisches Filterverfahren nach einem beliebigen Anspruch 8 bis 12, dadurch gekennzeichnet, daß die Quelle auch als Empfangseinrichtung dient.

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14. Optisches Filterverfahren nach einem beliebigen Anspruch 8 bis 13, dadurch gekennzeichnet, daß die Quelle und die Empfangseinrichtung aus einer Eingangslichtleitfaser bzw. einer Ausgangslichtleitfaser bestehen.

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Revendications

1. Un appareil d'accord de filtre optique comprenant:

un filtre optique (8) qui reflète une lumière d'une longueur d'onde prédéterminée, ladite longueur d'onde étant déterminée par la position d'incidence de ladite lumière sur ledit filtre;

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caractérisé en ce qu'il est disposé un rétro-reflecteur (32) mobile par rapport audit filtre afin de réfléchir une lumière venant d'une source optique (4, 10) vers ladite position d'incidence sur ledit filtre et de réfléchir la lumière de ladite longueur d'onde prédéterminée vers un moyen récepteur optique (6, 10);

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ladite position d'incidence et ladite longueur d'onde prédéterminée étant réglables en déplaçant ledit rétroreflecteur par rapport audit filtre.

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2. Un appareil d'accord de filtre optique selon la revendication 1 caractérisé par un moyen de lentille (10) servant à diriger une lumière depuis ladite

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- source vers ledit rétroreflecteur et à diriger une lumière filtrée depuis ledit rétroreflecteur vers ledit moyen récepteur, ledit moyen de lentille et ledit filtre optique étant fixes en position l'un par rapport à l'autre.
3. Un appareil d'accord de filtre optique selon la revendication 2, caractérisé en ce que ledit filtre et ledit moyen de lentille sont situés sensiblement dans un premier plan et ledit rétroreflecteur mobile d'une manière telle que le sommet du rétroreflecteur est mobile dans un deuxième plan sensiblement parallèle audit premier plan. 10
 4. Un appareil d'accord de filtre optique selon l'une quelconque des revendications précédentes caractérisé en ce qu'une lumière incidente sur ledit filtre et une lumière filtrée réfléchie depuis ledit filtre se déplacent sensiblement le long du même trajet. 20
 5. Un appareil d'accord de filtre optique selon l'une quelconque des revendications précédentes caractérisé en ce que ledit filtre optique est un filtre en gélatine dichromée (DCG) d'un réseau à stridulations. 25
 6. Un appareil d'accord de filtre optique selon l'une quelconque des revendications précédentes caractérisé en ce que ladite source sert aussi de moyen récepteur. 30
 7. Un appareil d'accord de filtre optique selon l'une quelconque des revendications précédentes, caractérisé en ce que ladite source et ledit moyen récepteur sont des fibres optiques d'entrée (4) et de sortie (6), respectivement. 35
 8. Un procédé de filtrage optique caractérisé par: 40
 - une réflexion d'une lumière à filtrer, venant d'une source optique (4, 10), sur un filtre optique (8) en utilisant un rétroreflecteur (32), la longueur d'onde de lumière réfléchie depuis ledit filtre dépendant de la position d'incidence de la lumière sur ledit filtre et ledit rétroreflecteur étant mobile par rapport audit filtre de façon à régler la disposition d'incidence; et 45
 - une réflexion de ladite lumière réfléchie, de ladite longueur d'onde prédéterminée, vers ledit moyen récepteur optique (6, 10) en utilisant ledit rétroreflecteur. 50
 9. Un procédé de filtrage optique selon la revendication 8, caractérisé en ce que la lumière venant de ladite source est dirigée sur ledit rétroreflecteur et la lumière filtrée est dirigée vers ledit moyen récepteur en utilisant un moyen de lentille (10), ledit moyen de lentille et ledit filtre optique 55
 10. Un procédé de filtrage optique selon la revendication 9, caractérisé en ce que ladite position d'incidence et ladite longueur d'onde prédéterminée sont réglées en déplaçant le sommet dudit rétroreflecteur dans un premier plan sensiblement parallèle à un deuxième plan dans lequel sont sensiblement situés ledit moyen de lentille et ledit filtre. 60
 11. Un procédé de filtrage optique selon l'une quelconque des revendications 8 à 10, caractérisé en ce qu'une lumière incidente sur ledit filtre et une lumière filtrée réfléchie par celui-ci se déplacent sensiblement le long du même trajet. 65
 12. Un procédé de filtrage optique selon l'une quelconque des revendications 8 à 11, caractérisé en ce que ledit filtre est un filtre en gélatine dichromée (DCG) à réseau à stridulations. 70
 13. Un procédé de filtrage optique selon l'une quelconque des revendications 8 à 12, dans lequel ladite source sert aussi de moyen récepteur. 75
 14. Un procédé de filtrage optique selon l'une quelconque des revendications 8 à 13, caractérisé en ce que ladite source et ledit moyen récepteur sont des fibres optiques d'entrée et de sortie, respectivement. 80