CLAIMS

1. Method for remote detection of gaseous substances in the atmosphere by a differential absorption LIDAR system with two lasers, wherein a laser beam generated by a first laser (1) impinges on a semipermeable mirror (3), where 50% of a laser beam power of the laser beam passes through the semipermeable mirror (3) and proceeds through a first aperture (4) towards a target and at the same time the remaining 50% of the laser beam power of the laser beam reflects from the semipermeable mirror (3), impinges on a totally reflecting mirror (5) from which it is reflected and is directed through a second aperture (6) to the same target; and a delayed laser beam generated by a second laser (2) impinges on the semipermeable mirror (3), where 50% of a laser beam power of the delayed laser beam passes through the semipermeable mirror (3), impinges on the totally reflecting mirror (5) from which it is reflected and is directed through the second aperture (6) to the same target and at the same time the remaining 50% of the laser beam power of the delayed laser beam reflects from the semipermeable mirror (3) and proceeds through the first aperture (4) towards the same target.

2. Differential absorption LIDAR system for remote detection of gaseous substances in the atmosphere consisting of two lasers,

wherein a first laser beam and a second laser beam advance from a first laser (1) and a second laser (2), respectively, and wherein the first and second lasers are arranged such that axes of the first and second laser beams intersect,

wherein at the intersection of the axes of the first and second laser beams, a semipermeable mirror (3) is located;

wherein behind the semipermeable mirror (3) in a first direction, which is a direction of undeflected travel of the second laser beam through the semipermeable mirror (3) which coincides with a direction of travel of the first laser beam reflected by the semipermeable mirror (3), a totally reflecting mirror (5) is located;

wherein a first aperture (4) is located behind the semipermeable mirror (3) in a second direction, which is a direction of undeflected travel of the first laser beam through the semipermeable mirror (3) which coincides with a direction of travel of the second laser beam reflected by the semipermeable mirror (3),

wherein the first aperture (4) receives a first merged beam comprising 50% of the first laser beam advance from the first laser (1) and 50% of the second laser beam advance from the second laser (2) which is reflected by the semipermeable mirror (3);

wherein a second merged beam travelling in the first direction is reflected by the totally reflecting mirror (5) into the second direction,

wherein the second merged beam comprises 50% of the first laser beam advance from the first laser (1) which is reflected by the semipermeable mirror (3) and 50% of the second laser beam advance from the second laser (2),

wherein a second aperture (6) is located in the second direction of travel of the second merged beam after the totally reflecting mirror (5) and receives the second merged beam, such that the first and second merged beams are directed in parallel to a target.