CLAIMS

1. A~~n optical difference~~ detector, comprising:

a first avalanche photodiode and a second avalanche photodiode ~~that~~ configured to amplify and to output a signal current according to input light;

a first voltage application unit ~~that~~ configured to apply~~ies~~ a first bias voltage to the first avalanche photodiode and a second voltage application unit ~~that~~ configured to apply~~ies~~ a second bias voltage to the second avalanche photodiode;

a differential amplifier ~~that~~ configured to be~~is~~ connected in parallel to the first avalanche photodiode and the second avalanche photodiode and to amplify~~ies~~ a difference between a first signal current output from the first avalanche photodiode and a second signal current output from the second avalanche photodiode;

an optical attenuator configured to attenuate input light to the first avalanche photodiode or input light to the second avalanche photodiode; and

a feedback controller configured to ~~unit that~~ control~~s~~ an amount of attenuation of the input light by the optical attenuator ~~at least one of the first bias voltage and the second bias voltage~~ so that a low frequency component of a first monitoring current in the first avalanche photodiode and a low frequency component of a second monitoring current in the second avalanche photodiode are equal.

2. The ~~optical difference~~ detector according to claim 1,

wherein the first monitoring current is a first bias current flowing through the first avalanche photodiode due to application of the

first bias voltage, and

the second monitoring current is a second bias current flowing through the second avalanche photodiode due to application of the second bias voltage.

3. The ~~optical difference~~ detector according to claim 1,

wherein the first monitoring current is the first signal current output from the first avalanche photodiode, and

the second monitoring current is the second signal current output from the second avalanche photodiode.

~~4. An optical difference detector, comprising:~~

~~a first avalanche photodiode and a second avalanche photodiode that amplify and output a signal current according to input light;~~

~~a first voltage application unit that applies a first bias voltage to the first avalanche photodiode and a second voltage application unit that applies a second bias voltage to the second avalanche photodiode;~~

~~a differential amplifier that is connected in parallel to the first avalanche photodiode and the second avalanche photodiode and amplifies a difference between a first signal current output from the first avalanche photodiode and a second signal current output from the second avalanche photodiode;~~

~~an optical attenuator that attenuates input light to the first avalanche photodiode or input light to the second avalanche photodiode; and~~

~~a feedback control unit that controls an amount of attenuation of the input light by the optical attenuator so that a low frequency component of a first monitoring current in the first avalanche~~

~~photodiode and a low frequency component of a second monitoring current in the second avalanche photodiode are equal.~~

~~5. The optical difference detector according to claim 4,~~

~~wherein the first monitoring current is a first bias current flowing through the first avalanche photodiode due to application of the first bias voltage, and~~

~~the second monitoring current is a second bias current flowing through the second avalanche photodiode due to application of the second bias voltage.~~

~~6. The optical difference detector according to claim 4,~~

~~wherein the first monitoring current is the first signal current output from the first avalanche photodiode, and~~

~~the second monitoring current is the second signal current output from the second avalanche photodiode.~~

~~7~~4. A~~n inspection~~ device, comprising:

a light source ~~that~~ configured to output~~s~~ inspection light toward a measurement target;

a magneto-optical crystal ~~that is~~configured to be disposed so as to face the measurement target; and

the ~~optical difference~~ detector according to ~~any one of~~ claim~~s~~ 1 ~~to 6~~,

wherein the first avalanche photodiode detects first inspection light having a first polarization component output from the light source and reflected by the magneto-optical crystal, and

the second avalanche photodiode detects second inspection light having a second polarization component output from the light source

and reflected by the magneto-optical crystal.