

ABSTRACT

A double-wavelength light source unit capable of stable signal detection, is realized.

The double-wavelength light source unit comprises a
5 double-wavelength light source, a photodetector and a
double-wavelength diffraction element, wherein the
double-wavelength diffraction element comprises a
diffraction grating which transmits a light beam of λ_1
and diffracts a light beam of λ_2 among the light beams of
10 wavelengths λ_1 and λ_2 ($\lambda_1 \neq \lambda_2$) emitted from two laser
diodes as the double-wavelength light source, a
diffraction grating which diffracts a light beam of λ_1
and transmits a light beam of λ_2 , a diffraction grating
constituted by a grating material forming a grating and a
15 filler which transmits a light beam of λ_1 since the
refractive indices of both of these materials are equal
at λ_1 and diffracts a light beam of λ_2 since the
refractive indices are different at λ_2 , and a diffraction
grating which transmits a light beam of λ_1 having a first
20 polarization plane and diffracts a light beam of λ_1
having a polarization plane perpendicular to the first
polarization plane.