Measurement of angular velocity of a diffuse surface using speckel photography

Deti Nurdiawati, author

Abstrak

ABSTRACT
We propose a method for measuring the angular velocity of a rotating diffuser by speckle photography employing a simple optical system and single exposure. The information is extracted by pointwise and Fourier filtering techniques.

A speckle pattern occurs when a ground glass for transmission and aluminum for reflection as a diffuse object is illuminated by coherent light and recorded on a negative film. To measure the angular velocity during the exposure, as the diffuser rotates the speckle pattern also rotates and each speckle elongates. Each elongated speckle becomes a rectangular slit, which produces a diffraction pattern that gives information about the object. In this experiment angular velocity at 1.36 deg/sec, 2.3 deg/sec, 2.72 deg/sec, 3.3 deg/sec and 4.3 deg/sec has been measured.

