

Telescopic Lasers for PIV

Broader, Thinner and More Uniform Light Sheets

Litron offers telescopic versions of its popular Nano L and LPY PIV laser systems for dual pulse applications requiring a significantly lower M^2 value than traditional lasers but with the excellent spatial uniformity of a conventional resonator.

This gives the possibility to make broad, thin, uniform light sheets for large area or high resolution PIV studies.

Litron can achieve a beam divergence as low as 0.8mrad at 532nm by placing a telescope inside the resonator. This is

around four times lower than with a conventional laser and around twice that of a Gaussian coupled laser. However, the Gaussian coupled laser suffers from poor mid-field spatial uniformity, leading to non-uniform illumination of the experimental area.

Beam divergence does not tell the whole story. A 'figure of merit' for comparing a laser beam's focusability is M^2 -squared. A theoretically perfect laser beam has an M^2 value of one and real lasers have values of greater than one; the actual value of a real laser beam denotes how many times narrower or thicker a light sheet will be compared with a sheet from a perfect beam.

For Gaussian unstable lasers, M^2 is typically less than the value predicted by measuring the divergence and beam diameter at the output; the two values are usually closely related for stable lasers.

For PIV applications, a four times lower M^2 value means that a light sheet can be four times thinner for a given propagation distance or else four times longer for a given thickness.

For more information contact: Litron Lasers
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Comparison of Laser Types

	M^2 Value	Light Sheet Extent	Light Sheet Uniformity
Conventional Stable	~12-15	Fair	Excellent
Gaussian Unstable	~1.6-1.8	Excellent	Poor
Telescopic Stable	~3.5	Very Good	Excellent

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