

论文

水中受激布里渊散射阈值的研究

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摘要:

在对水中受激布里渊散射阈值的研究中, 针对传统定义上的不足, 提出一种新的定义和新的测量方法。测量了不同能量的光束在不同长度的水介质中传输, 在宽线宽和窄线宽情况下水的衰减系数。通过水的衰减系数的变化来确定不同情况下受激布里渊散射的阈值。试验发现, 水中的受激布里渊阈值在理想稳态和理想瞬态下是一个常数, 只与泵浦激光和介质属性有关, 和介质长度无关; 在中间情况下, 受激布里渊阈值是否与介质长度有关, 还要根据具体情况来分析。

关键词: 受激布里渊散射; 衰减系数; 散射阈值

Threshold study of stimulated Brillouin scattering in water

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Abstract:

In order to solve the insufficiency in the traditional definition for SBS threshold, a new definition and a novel measuring technique are proposed. The transmission of beam with different energy was measured at different lengths of water, and the attenuation coefficient of laser beam with different pulse energy was tested. The SBS threshold under different conditions was confirmed based on the attenuation coefficient. It was found during the experiment that the SBS threshold under the ideal stable state and the ideal transient state is a constant, it is related only to the pump laser and medium attribute, but not to the medium length. To other cases, the relationship between SBS threshold and length will be studied through further experiment.

Keywords: stimulated Brillouin scattering attenuation coefficient scattering threshold

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