The University of Adelaide
School of Chemistry and Physics

Experimental Study of Stimulated Brillouin Scattering in Open Cells and Multimode Optical Fibres

By

Allan Chi-Lun Wong

B.Sc. (*Flinders*), B.Sc.(Hons.) (*Adelaide*)

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Statement of Originality

This work contains no material which has been accepted for the award for any other degree or diploma in any university or other tertiary institution and, to the best of my knowledge and belief, contains no material previously published or written by another person, except where due reference has been made in the text.

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Signed: ………………………………

Date: …………………………………

Supervisor: Professor Jesper Munch

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Abstract

An experimental study of the stimulated Brillouin scattering (SBS) were performed by performing optical phase conjugation in open cells and multimode optical fibres using a Q-switched, pulsed Nd:YAG laser (λ = 1.064μm). Experiments were done with test tubes that contained two SBS liquids – Fluorinert and Acetone, and multimode optical fibres with 62.5μm core diameter. The three fundamental parameters of SBS: the threshold energy, reflectivity and phase conjugate fidelity were characterised and analysed. In addition, the temporal behaviour of Stokes beam, phase correction, optical breakdown, and pulse compression were investigated.

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