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Acoustic and Optical Properties of Er³⁺- doped LiNbO₃ ALEM TEKLU, NARAYANAN KUTHIRUMMAL, DANIEL MORRALL, JAY DANDREA, College of Charleston — Elastic constants of pure and Er³⁺ doped lithium niobate (LiNbO₃) single crystals have been determined using resonant ultrasound spectroscopy (RUS). When comparing the elastic constants for pure and doped LiNbO₃ crystals, the bulk modulus was found to increase by 5.2% after doping. Also the elastic constants were compared. C₁₁ decreased by 4%, C₁₂ increased by 18% and C₄₄ increased by 16.6%. The surface-doping explains the decrease in elastic constant in only one direction. The presence of Er³⁺ ions on the surface of LiNbO₃ has been monitored using photoacoustic spectroscopy. The photoacoustic spectrum revealed very weak absorptions corresponding to $4F^{7/2}$, $4F^{9/2}$ and $2H^{11/2}$ levels of Erbium, indicating the presence of Erbium.

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