

Abstract Submitted
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Investigation of Defect Structure to Determine the Primary Photorefractive Centers Responsible for Enhanced Beam Coupling in $\text{KNbO}_3\text{:Fe}$ DEAN EVANS, Air Force Rsch Lab - WPAFB, SERGEY BASUN¹, Azimuth Corp., AIR FORCE RSCH LAB - WPAFB TEAM, AIR FORCE RSCH LAB - WPAFB TEAM — A series of experiments are used to determine the location of the energy levels of various Fe centers and associated defect centers in $\text{KNbO}_3\text{:Fe}$, as well as conclude which centers are the primary photorefractive centers. In particular, the methods include electron paramagnetic resonance, optical absorption spectroscopy, electric conductivity, and beam coupling. A correlated study using data acquired with these techniques has been performed on as-grown (unreduced) and reduced $\text{KNbO}_3\text{:Fe}$ crystals, which identified which Fe centers were reduced and which ones were not. Conditions for an increased electron source population (improved beam coupling performance) was determined and compared to beam coupling results for pure electron, pure hole, and electron-hole competition processes.

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