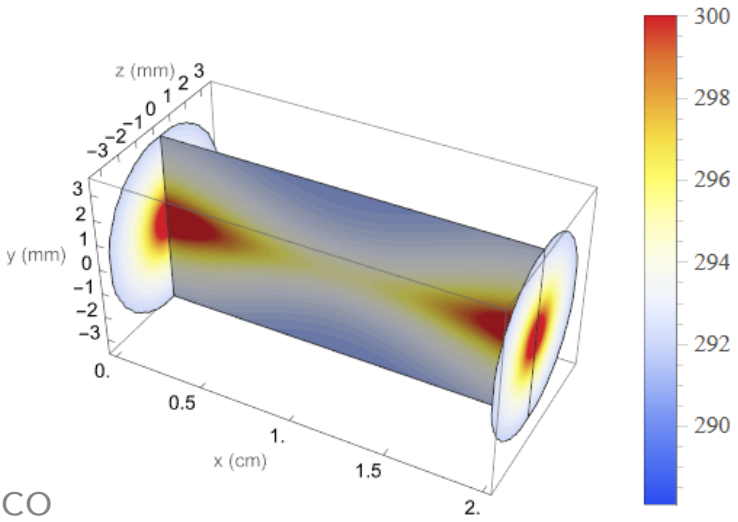
Physics Department Seminar

11 am April 19, 2024 Science Building Room 126

Dynamic Simulation of the Thermal Lensing in a Ti:Sa Laser Crystal



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Thermal lensing is a phenomenon that arises due to temperature gradients in optically pumped laser crystals. The crystal behaves as a lens which affects the propagation of the laser mode in the resonator. Therefore, to design a stable resonator, the focal length due to thermal lensing must be calculated or experimentally measured. We present a dynamic simulation created using Wolfram Mathematica, which allows a user to calculate the temperature gradient in a Titanium:Sapphire (Ti:Sa) laser crystal and the corresponding thermal focal length. The simulation results can assist in designing a stable resonator for crystals with various physical dimensions and constraints. In comparison to findings reported in prior publications, our simulation produced results that closely align. With a successful comparison, the simulation can be used to aid in the design of a stable resonator for Ti:Sa crystals, or extrapolated to other crystals by updating the code to reflect their physical properties.