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Thermal Lens Mitigation And Modeling In Chromium-Doped Zinc Selenide Laser Sources PATRICK BERRY, KENNETH SCHEPLER, Air Force Research Lab, Sensors Directorate, 2241 Avionics CL, WPAFB, OH 45433, PETER POWERS, University of Dayton, 300 College Park, Dayton, OH 45469 — Cutting edge military and scientific applications require compact solid-state laser sources tunable in the 2-5 micron region. Divalent chromium-doped zinc selenide sources show great promise in this area but the development of these lasers has been hampered by their susceptibility to thermal lensing. A carefully chosen temperature management scheme can yield high returns in terms of reducing thermal issues. In order to reduce the experimental cost of investigating these designs, mathematical models of proposed thermal lensing solutions were produced using finite element analysis software and used to determine the best design for experimental verification. The chosen design, a pass-through pumped thin disk laser with dual windows, was simple to construct and showed no thermal issues for pulsed operation at suitable frequencies. This laser was made to demonstrate thermal issues at higher pulse repetition frequencies and lower outcoupler reflectivies. This type of laser was shown to be a good alternative to both the simple rod laser and the basic face-cooled thin disk laser.

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