Editor Note

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Growth of Laser Crystal and Mid-Infrared Laser Technology

Dunlu Sun*

Researcher, Anhui Institute of Optics and Fine Mechanics, Chinese Academy of Sciences, China

***Corresponding Author**
Dunlu Sun, Researcher, Anhui Institute of Optics and Fine Mechanics, Chinese Academy of Sciences, China

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My research interests are the growth of laser crystal and mid-infrared laser technology. In recent years, Er^{3+}-doped crystals have been paid extensive attention due to the transition between $^4I_{11/2}$ and $^4I_{13/2}$ excited states producing 2.7-3 μm laser. It is due to the 2.7-3 μm laser is in the strong absorption band of water and biological tissues and has also high atmospheric transmittance in a special wavelength, leading to numerous applications in the fields of biomedicine, industry, and science research, etc. In addition, some nonlinear crystals have low absorption loss in the 2.7-3 μm waveband, so it can be used as an ideal pump source for optical parametric oscillators (OPO) to obtain lasers in the 3-5 and 8-14 μm mid-infrared wavebands. In our group, we have grown successfully many Er^{3+} or Ho^{3+} doping laser crystal with high optical quality, such as Er:YSGG, Cr,Er:YSGG, Er:YAP, Er:GYSGG, Er:LuYSGG, Ho:YAP and so on. Moreover, the 2.7-3 μm lasers with high laser performance have been achieved by flash-lamp pumping, 970 nm LD end and side-pumping, and laser performances have also been improved further by thermal bonding and concave end-faces, which relevant works have been published in the Optics Letters, Optics Express, Optics Communications, and Optics and Laser Technology, etc.