

Growth of Laser Crystal and Mid-Infrared Laser Technology**Dunlu Sun**

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My research interests are the growth of laser crystal and mid-infrared laser technology. In recent years, Er³⁺-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 Er³⁺ or Ho³⁺ 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.

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