Oddělení diodově čerpaných laserů a realizační tým projektu HiLASE
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Ho doped potassium rare earth double tungstate laser operating around 2.1 µm

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In recent years, there is an increasing interest in eye-safe solid-state infrared lasers based on Ho^{3+} ions (Ho) operating slightly above 2 µm due to the potential applications in the fields of medicine, remote sensing and as a pump source for OPO´s. The main drawback of the Ho ion is that it does not exhibit suitable absorption bands for efficient pumping. In order to overcome this drawback, we followed mainly two strategies: 1) using the Tm^{3+}(Tm) ion as sensitizer and pumping around 802 nm using Ti:Sapphire laser as pump source, 2) using direct pumping of the emitting level of Ho by means of Tm or diode lasers operating near 1.9 µm.

Concerning the host, the monoclinic potassium rare double tungstate crystals with formula $KRE(WO_4)_2$ (RE = Y, Gd, Lu) (hereafter KREW), stand out because of their high absorption and emission cross-sections when doped with lanthanide ions and weak concentration quenching of the fluorescence which is related to the relatively long dopant-to-dopant separation. More recently KLuW was shown to be especially suited for Yb and Tm ions for intermediate power levels.

Results of the first strategy shows a maximum output power of 145 mW with a slope efficiency of 13% centred at 2061 nm and results of the second strategy shows a maximum output of 408 mW with a slope efficiency of 55% centred at 2079 nm. Present work is focused on pulsed laser operation (Q-switching) and growth of thin disk samples are under work for scaling up the power.

který se bude konat dne 26. 10. 2010 od 11:00 v zasedacím sále Fyzikálního ústavu AV ČR, v.v.i.