

## **ACOUSTICS2008/1360**

### **Optimization of KDP-based acousto-optic imaging filters**

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Acousto-optic devices can perform spatial and spectral tunable filtration of light with the use of anisotropic Bragg diffraction. In the near UV range of spectrum, KDP single crystals provide the highest acousto-optic figure of merit among uniaxial crystals. The report is devoted to the problem of optimization of the filter parameters in order to maximize angle aperture of the instruments. It was found that the maximum angle aperture of wide angle tunable acousto-optic filters is equal to 3 degrees in air at output of the KDP crystals. This magnitude of the angle aperture is limited by a narrow deflection angle of light in KDP that is due to a relatively low birefringence of the material. The investigation showed that the diffraction efficiency of light depends on the dimensions of the acousto-optic cell, i.e. linear aperture and length of a piezoelectric transducer. A discussion on trade-off between transmission coefficient and the spatial resolution in the filter is presented in the report.