

# **Novel visible-infrared Faraday crystal $\text{Tb}_3\text{Al}_3\text{Ga}_2\text{O}_{12}$ exhibiting superior magneto-optical performance**

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In the past decades, the  $\text{Tb}_3\text{Ga}_5\text{O}_{12}$  crystal has long been market dominating for visible near-IR Faraday applications. However, its relatively low Verdet constant as well as heavy volatilization of  $\text{Ga}_2\text{O}_3$  during growth make it challenging to meet the continuous development of advanced lasers. In this work, a novel  $\text{Tb}_3\text{Al}_3\text{Ga}_2\text{O}_{12}$  (TAGG) crystal has been grown and investigated for the first time [1]. We demonstrated that the TAGG crystal possesses a better visible transparency, a higher thermal conductivity and a larger Verdet constant than  $\text{Tb}_3\text{Ga}_5\text{O}_{12}$  crystal. Moreover, due to the greatly reduction of Ga-content, it is more capable to fabricate large-size low cost single crystal. TAGG crystal is therefore a very promising material for commercial magneto-optical applications in the visible-near IR wavelength region.

## **References**

[1] Xianhui XIN, Yuankai HAO, Lei LIU, Junai LV, Jian ZHANG, Xiuwei FU\*, Zhitai JIA\*, and Xutang TAO.  $\text{Tb}_3\text{Al}_3\text{Ga}_2\text{O}_{12}$ : A novel visible-infrared Faraday crystal exhibiting superior magneto-optical performance. *Crystal Growth & Design*. 2022; 22: 5535-5541.