

# Second-harmonic generation studies of inhomogeneous magnetization distributions in thin garnet film

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In the paper [1] we have demonstrated on the example of thin garnet film that magnetization processes can be effectively studied using magnetization-induced second harmonic generation effect (MSHG). The aim of the current work is the investigation of inhomogeneous magnetization distributions induced in the surface area of the garnet film by ion implantation. The studies were performed on magnetic garnet film of (111) symmetry, implanted with  $\text{H}_2^+$  ions of  $1.5 \times 10^{16} \text{ cm}^{-2}$  dose and 60 keV energy. The measurements of MSHG effect were performed as a function of the sample-normal rotation angle and the amplitude of external magnetic field. The observed MSHG intensity hystereses were subjected to a decomposition procedure into contributions having different magnetic field dependences. The contributions originating from the implanted and unimplanted parts of the film volume of different magnetic ordering were analyzed and discussed.

## References:

[1] A. Bonda, S. Uba, and L. Uba, Phys. Rev. B 87, 024426 (2013).