

Investigation of photo-induced chirality in chalcogenide phase-change memory materials

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It has been recently observed that a mirror-symmetric circular dichroism (CD) signal can be induced in amorphous and originally achiral pure and doped $\text{Ge}_2\text{Sb}_2\text{Te}_5$ (GST) thin film materials by crystallising the materials using left or right circularly polarised light [1].

Since the first observation of the phenomenon in GST thin films the signal has been increased by over two orders of magnitude through optimisation of film deposition and parameters of laser illumination, Figure 1.

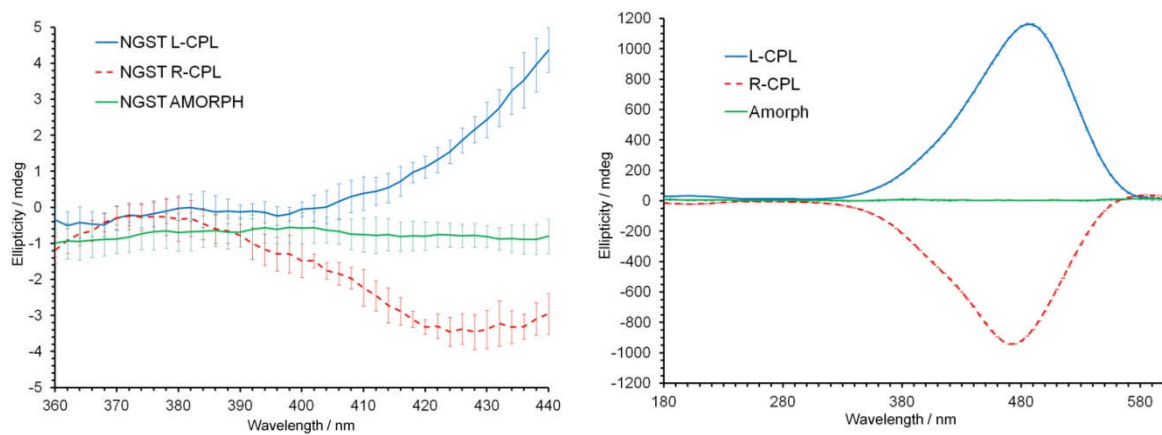


Figure 1. Double CD spectra for amorphous and crystalline N-doped (left) and pure $\text{Ge}_2\text{Sb}_2\text{Te}_5$ (right) films induced using right circularly polarised light (R-CPL) and left circularly polarised light (L-CPL).

We will discuss recent results of the studies with possible implications for increased information storage capacity, chiral sensors and metamaterials.

[1] K. B. Borisenko et al. Photo-induced optical activity in phase-change memory materials. *Sci. Rep.* 5 (2015) 8770.