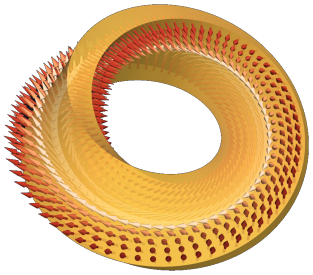

Contribution ID: **11** Type: **Oral**

Deposition of homogeneous magnetic layers on 3D non-conductive microstructures

Friday, 24 May 2019 12:00 (15 minutes)

In comparison to planar structures, three-dimensional magnetic micro- and nanostructures offer greater degrees of freedom, showing novel properties such as magneto chirality effects [1], enhanced domain wall dynamics [2] and curvature-induced anisotropy [3]. Exploiting such effects can lead to great benefits for new applications like high-density storage devices, as well as artificial spin systems that provide the possibility of creating and tailoring specific physical properties.

While new insights into realizing the investigation of 3D magnetic systems are highly desired, the fabrication of three-dimensional systems is still challenging due to the lack of reliable methods for the deposition of magnetic thin films on high gradient surfaces.

Here, we present the electroless deposition of NiFe on a 3D-printed, non-conductive microstructure.

Low coercivity and low magnetocrystalline anisotropy are well-known properties of permalloy, making it the ideal material for the study of the influence of three dimensionality on the magnetic properties of a system. In contrast to widely used sputtering, which leads to significant shadowing effects [4], with electroless deposition we can achieve the deposition of homogeneous layers, covering the whole framework (fig.1). This new technique represents an important step towards the experimental realisation of 3D magnetic nanostructures with tailored properties.

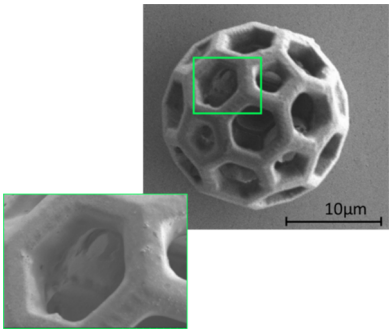

Figure 1: FIG1

FIG. 1

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[4] Donnelly, C., et al., Element-Specific X-Ray Phase Tomography of 3D Structures at the Nanoscale. Physical Review Letters, 2015. 114(11): p. 115501.

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