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Impact of MgO thickness on the perpendicular magnetic anisotropy of Mo/Co_2FeAl/MgO/Mo multilayers with improved annealing stability

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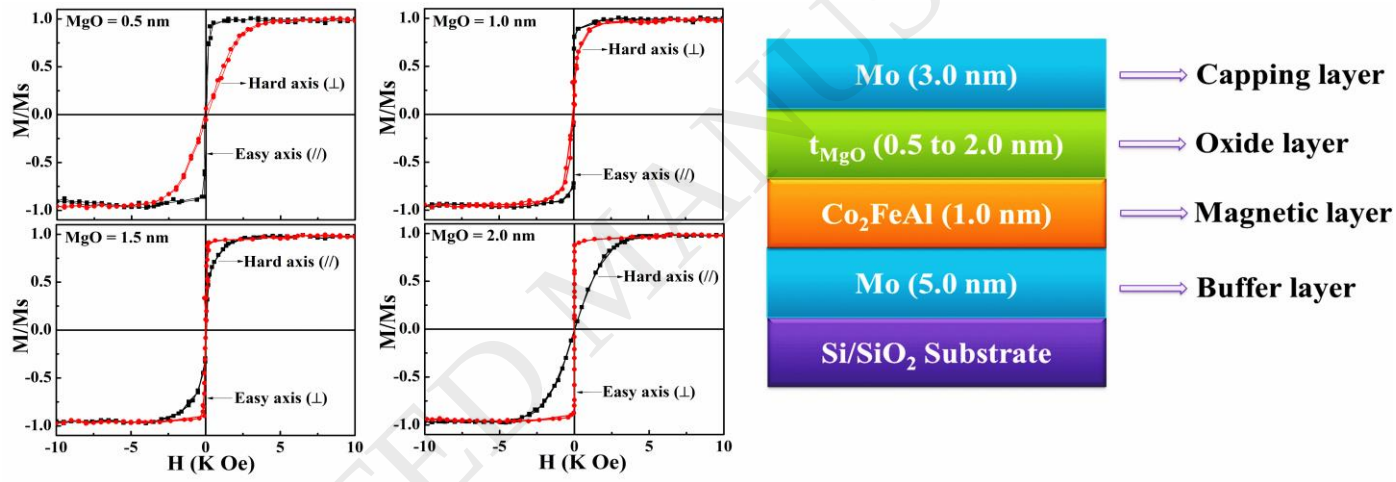
Graphical Abstract



Highlights

- Robust PMA is demonstrated for thermally stable Mo/Co_2FeAl(CFA)/MgO/Mo multilayer
- Thickness of CFA and MgO over-layer plays a main role in achieving the strong PMA
- Significant PMA energy of $K_{eff} \approx 1.67 \times 10^6$ erg/cm^3 is achieved for film annealed at 400°C
- Co and/or Fe – $3d_{Z^2}$ and O-$2P_Z$ orbital hybridization at interface is the origin for PMA