

## Controlling perpendicular magnetic anisotropy of ferromagnetic layers by applying Pd-based antiferromagnetic alloy films

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Antiferromagnetic (AFM) films have been proposed as a new approach to current methods for generating the perpendicular magnetic anisotropy (PMA) of adjacent ferromagnetic (FM) film. By applying  $Mn_xPd_{1-x}$  AFM alloy films, this work reports that the different characteristics of PMA can be induced on adjacent Co/Ni or Co/Fe films depending on their thickness and alloy composition. The results of magnetic hysteresis loops of  $Mn_xPd_{1-x}/Co/Ni$  alloy films show that PMA with low coercivity ( $H_c$ ) can be induced by thin  $Mn_xPd_{1-x}$  film when Pd concentration is larger than 10% due to an enhanced contribution of perpendicular interface anisotropy from Pd element. By contrast, PMA with sizeable  $H_c$  enhancement can be achieved when applying Mn concentration greater than 90% at 300 K and 75% at 180 K, caused by Mn-induced AFM exchange coupling.

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