SUPPLEMENTARY INFORMATION

Figure S1. Magnetization of the ferromagnetic components normalized with respect to the total magnetization to facilitate comparisons.

Figure S2. Minor loops measured at different temperatures (left) and an example showing the method used to obtain the field shifts (right).
Figure S3. Contour plots for the magnetic energy density used to model the magnetization of the CeO$_2$/Au/(Co/Pt)-ML nanostructure. Bidimensional isolines around the local minimum of energy density for an applied field value near the switching field of CeO$_2$ with (a) and without (b) magnetic coupling between ferromagnetic layers. The magnetic coupling strength in Eq.(1) enlarges the regions of the energy density local minimum, where parallel alignment of the magnetizations is stable. Asymmetries along the polar axes are due to the distinct energy densities to switch each ferromagnetic layer. Traditional warm–cool color contrast is used to describe minima (blue) and maxima (red) of the energy density.