Abstract Submitted
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Nanoscale Confinement of All-Optical Magnetic Switching in TbFeCo[1] TIANMIN LIU, TIANHAN WANG, Stanford University, ALEXANDER REID, SLAC National Accelerator Laboratory, MATTEO SAVOINI, Radboud University Nijmegen, XIAOFEI WU, Universitat Wrzburg, BENNY KONENE, Radboud University Nijmegen, PATRICK GRANITZKA, University of Amsterdam, CATHERINE GRAVES, DANIEL HIGLEY, ZHAO CHEN, Stanford University, GARY RAZINSKAS, Universitat Wrzburg, MARKUS HANTSCHMANN, Institute Methods and Instrumentation for Synchrotron Radiation Research, ANDREAS SCHERZ, JOACHIM STOHR, SLAC National Accelerator Laboratory, ARATA TSUKAMOTO, College of Science and Technology, BERT HECHT, Universitat Wrzburg, ALEXEY KIMEL, ANDREI KIRILYUK, THEO RASING, Radboud University Nijmegen, HERMANN DURR, SLAC National Accelerator Laboratory, DURR/STOHR TEAM, THEO RASING TEAM, ARATA TSUKAMOTO TEAM, BERT HECHT TEAM — Gold two-wire antennas structures are placed upon the surface of the all-optical switching film TbFeCo. They resonate with the optical field and create a field enhancement in its vicinity, which is used to confine the area where optical switching can occur. It is demonstrated that single femtosecond optical laser pulses can reverse magnetization in a controllable fashion by such confinement. The magnetic states are imaged using resonant X-ray holography and magnetic circular dichroism. The results not only show the feasibility of controllable switching with antenna assistance but also demonstrate the highly inhomogeneous nature of the switching process, which is attributed to the material's heterogeneity.

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