Abstract Submitted
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Ultrafast measurements of the magnetic and structural phase transition of FeRh in the extreme ultraviolet range[1] DMITRIY ZUSIN, PATRIK GRYCHTOL, EMRAH TURGUT, HENRY KAPTEYN, MARGARET MURNANE, JILA, University of Colorado, Boulder, CO 80309, RONNY KNUT, JUSTIN SHAW, HANS NEMBACH, THOMAS SILVA, Electromagnetics Division, National Institute of Standards and Technology, Boulder, CO 80305, ALEJANDRO CEBALLOS, CATHERINE BORDEL, PETER FISCHER, FRANCES HELLMAN, University of California, Berkeley, CA 94720 — The temperature dependent transition from the anti-ferromagnetic to the ferromagnetic phase in FeRh is accompanied by a modification of its crystal lattice. In spite of extensive investigations, the interplay between the magnetic and the structural transition is still a matter of strong debate. A better understanding of the phase transition mechanism(s) is important, since the transition can be induced by femtosecond laser pulses and does not seem to be limited by heat transfer, as is the case in magnetic phase transitions that occur on longer (nanosecond) time scales. In this work, we use extreme ultraviolet radiation generated by a tabletop high harmonics source to perform element-selective investigations of the temperature-dependent magneto-optical response of a thin film FeRh sample. We study the optically induced phase transition using two ultrafast pump-probe spectroscopy approaches: by monitoring the time-resolved transversal magneto-optical Kerr effect (T-MOKE) and the transient change in reflectivity.

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