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Collective Mode Splitting in Coupled Ferromagnet/Oxide Heterostructures[1] JUAN G. RAMIREZ, Department of Physics, Universidad de los Andes, Bogotá 111711, Colombia, J. DE LA VENTA, Dep. of Physics, Colorado State University, Fort Collins, CO 80523, USA, SIMING WANG, Lawrence Berkeley National Laboratory, Berkeley, California 94720, USA, THOMAS SAERBECK, Institut Laue-Langevin, 71 avenue des Martyrs, 38000 Grenoble, France, ALI C. BASARAN, Department of Physics, Gebze Technical University, Gebze, Kocaeli 41400, Turkey, X. BATLLE, Departament de Física Fonamental Universitat de Barcelona, 08028 Barcelona, Catalonia, Spain, IVAN K. SCHULLER, Department of Physics, University of California San Diego, La Jolla, CA 92093 USA — The coupling of electronic, magnetic, and structural properties between two dissimilar materials in contact can induce novel functionalities. Here we report on a drastic modification of the magnetization dynamics of thin Nickel films in Ni/V_2O_3 bilayers. We performed temperature-dependent ferromagnetic resonance measurements across the first-order structural phase transition (SPT) of V_2O_3. The results show a strong coupling of the V_2O_3 lattice dynamics to the magnon spectra of the Ni film in proximity. We have performed similar measurements across the second-order SPT in $Ni/SrTiO_3$ hybrids. In this later case, only a slight change of the static magnetization was found with no modification of the magnetization dynamics. Our results suggest that the phase coexistence across the first-order SPT of V_2O_3 is responsible for the effects observed in the Ni/V_2O_3 hybrids. This suggests the existence of similar effects in other hybrid materials with first-order structural phase transitions.

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