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Coupling of non-crossing wave modes in a two-dimensional plasma crystal JOHN MEYER, INGO LAUT, SERGEY ZHDANOV, VLADIMIR NOSENKO, HUBERTUS THOMAS, German Aerospace Center (DLR) — We report an experimental observation of coupling of the transverse vertical and longitudinal in-plane dust-lattice wave modes in a two-dimensional complex plasma crystal in the absence of mode crossing. A new large diameter (90 cm) rf plasma chamber was used to suspend the plasma crystal. The observations are confirmed with molecular-dynamics simulations. The coupling manifests itself in traces of the longitudinal mode in the measured transverse vertical spectra and vice versa. We calculate the expected ratio of the trace to the principal mode with a theoretical analysis of the modes in a crystal with finite temperature and find good agreement with the experiment and simulations.

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