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Experimental observation of whistler waves arising from mode transitions between pairs of discrete Langmuir cavity modes.[1] M. KOEPKE, West Virginia University, Morgantown, WV, USA, N. BRENNING, I. AXNAS, Royal Institute of Technology (KTH), Stockholm, Sweden — Bursty whistler wave packets, excited spontaneously in the Green Tank at KTH, by a B-aligned electron beam from a hot cathode, appear as wave packets, each with 0.1 - 1 microseconds duration and altogether covering a few percent of time. Wave packets, each dominated by a single frequency, are found in a broad frequency range, 7 – 40 MHz [Brenning et al., J. Geophys. Res. submitted]. Also seen are electrostatic oscillations, 300-500 MHz, covering numerous standing-wave frequencies, in a narrow HF-spike structure [Gunell, PhD thesis, 1997] located at the high potential side. Here we demonstrate the correlation between electrostatic mode transitions (occurrence, mode-pair frequency difference, and mode frequency-modulation) and wave-packets (occurrence, frequency, and envelope). We conclude that an individual whistler wave packet arises from a cavity-mode transition. Wave packets are observed only when the cavity mode separations are within the whistler range.

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