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Drift Instability of Double Quantum Wire Plasmons Coupled to Optical Phonons VASSILIOS FESSATIDIS, Fordham University, Bronx, NY, NORMAN HORING, Stevens Institute of Technology, Hoboken, NJ — We examine drift instability of the collective modes of a double quantum wire system with equal and opposite drift velocities in the two wires. In this study we consider the double quantum-wire system embedded in a semi-infinite polar medium, taking account of the role of optical phonons in interaction with the double quantum-wire plasmons and bulk/surface plasmons. The collective mode frequencies are exhibited as functions of q_x (wavenumber parallel to the wires) and as functions of z_0 (distance of first wire from the interface). We find that the region of drift instability of the collective modes is split into two disjoint regions of instability by the optical phonons, with a region of stability between them.

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