Abstract Submitted
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Vortex Fractionalization in a Josephson Ladder[1] DAVID STROUD, IVAN TORNES, Ohio State University — We show numerically that in a Josephson ladder with periodic boundary conditions and subject to a suitable transverse magnetic field, a vortex excitation can break up into two or more fractional excitations. If the ladder has N plaquettes, and N is divisible by an integer q, then in an applied field of 1/q flux quanta per plaquette, the ground state is a regular lattice of one fluxon every q plaquettes. When an additional fluxon is added, it spontaneously breaks up into q fractional fluxons, each carrying 1/q units of vorticity. The fractional fluxons are basically walls between different domains of the underlying 1/q lattice. The fractional fluxons are all depinned at the same applied current and move as a unit. For certain applied fields and ladder lengths, we show that there are isolated fractional fluxons. The fractional fluxons produce a time-averaged voltage related in a characteristic way to the ac voltage frequency.

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