

Abstract— We investigate exceptional points of degeneracy (EPDs) of a single transmission line (TL) by applying periodic space-time modulation to the per-unit length distributed capacitance. In such a space-time modulated transmission line (STM-TL), two eigenmodes coalesce into a single degenerate one in their eigenvalues and eigenvectors when the system approaches the EPD condition. We explain the occurrence of the EPD by using the Puiseux fractional power series expansion. We also show the STM-TL sensitivity to small perturbation of any TL or external modulation signal parameters. It enables a possible application as a highly sensitive TL sensor when operating at an EPD.