A semilinear wave equation with nonmonotone nonlinearity

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Abstract. In the context of semilinear equations where the derivative of the nonlinearity includes an eigenvalues of infinite multiplicity, we prove that a semilinear wave equation with nonmonotone nonlinearity and no resonance cannot have continuous solutions despite having smooth data. This new phenomenon in semilinear equations is found in first order quasilinear equations due to intersecting characteristics (shocks).