WELL-POSEDNESS OF THE TWO-DIMENSIONAL NONLINEAR SCHRÖDINGER EQUATION WITH CONCENTRATED NONLINEARITY

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ABSTRACT. We consider a two-dimensional nonlinear Schrödinger equation with concentrated non-linearity. In both the focusing and defocusing case we prove local well-posedness, i.e., existence and uniqueness of the solution for short times, as well as energy and mass conservation. In addition, we prove that this implies global existence in the defocusing case, irrespective of the power of the nonlinearity, while in the focusing case blowing-up solutions may arise.

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