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Critical Dynamics in Quenched 2D Atomic Gases[1] F. LARCHER, Joint Quantum Centre (JQC) Durham-Newcastle, Newcastle University, UK and INO-CNR BEC Center and Dip. di Fisica, Trento University, Italy, F. DALFOVO, INO-CNR BEC Center and Dipartimento di Fisica, Trento University, Italy, N. P. PROUKAKIS, JQC Durham-Newcastle, Newcastle University, UK — Non-equilibrium dynamics across phase transitions is a subject of intense investigations in diverse physical systems. One of the key issues concerns the validity of the Kibble-Zurek (KZ) scaling law for spontaneous defect creation. The KZ mechanism has been recently studied in cold atoms experiments [1,2]. Interesting open questions arise in the case of 2D systems, due to the distinct nature of the Berezinskii-Kosterlitz-Thouless (BKT) transition [3]. Our studies rely on the stochastic Gross-Pitaevskii equation. We perform systematic numerical simulations of the spontaneous emergence and subsequent dynamics of vortices in a uniform 2D Bose gas, which is quenched across the BKT phase transition in a controlled manner, focusing on dynamical scaling and KZ-type effects. By varying the transverse confinement, we also look at the extent to which such features can be seen in current experiments [4]. REFS: [1] Weiler et al., Nature 455, 948 (2008); Corman et al, Phys.Rev.Lett. 113, 135302 (2014); Navon et al., Science 347, 6218 (2015) [2] Lamporesi et al., Nat.Phys. 9, 656 (2013); Serafini et al., Phys.Rev.Lett. 115, 170402 (2015) [3] Jelić et al., J.Stat. Mech. P02032 (2011) [4] Chomaz et al., Nat.Comm. 6, 6162 (2014).

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