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Temporal and thermal dependence of a persistent, quantized current in a BEC AVINASH KUMAR, STEPHEN ECKEL, FRED JENDRZEJEWSKI, GRETCHEN CAMPBELL, University of Maryland, College Park — We study the decay dynamics of a persistent, quantized current in a ring-shaped Bose-Einstein condensate (BEC), to compare with the behaviors seen in a recent theoretical study that predicts that thermally activated phase slips play a role in persistent current decays [*Phys. Rev. A*, **90**, 023604 (2014)] . After inserting a persistent current into the ring, we raise a barrier potential to attempt to interrupt the flow. When the local flow velocity inside this barrier region, or "weak link," exceeds the critical velocity of the superfluid, a phase slip occurs and the flow ceases. We investigate the time needed for this phase slip to occur and the role of temperature in this process. We find that the maximum barrier height at which we can sustain a persistent current changes as we vary the temperature but keep the chemical potential and trapping parameters constant. This behavior is similar to that observed in recent theoretical work.

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