

Abstract Submitted
for the DAMOP18 Meeting of
The American Physical Society

Experimental Investigation of Three-Component Solitons in $F = 1$ Bose-Einstein Condensates¹ THOMAS BERSANO, VANDNA GOKHROO, PETER ENGELS, Washington State University — Dilute-Gas Bose-Einstein condensates are an exceptionally versatile test bed for the investigation of novel solitonic structures. While matter-wave solitons in one- and two-component systems have been the focus of intense research efforts, here we provide an extension to three-component systems. We demonstrate the existence of robust dark-bright-bright (DBB) and dark-dark-bright solitons in a multicomponent $F = 1$ condensate. We observe lifetimes on the order of hundreds of milliseconds for these structures. Our experimental findings are corroborated by direct numerical simulations highlighting the persistence of, e.g., the DBB solitons states, as well as their robust oscillation in the trap.

¹Support by the NSF is gratefully acknowledged.

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Date submitted: 26 Jan 2018

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