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Spin-tensor-momentum-coupled Bose-Einstein condensates XI-
WANG LUO, KUEI SUN, CHUANWEI ZHANG, Physics Department, The University of Texas at Dallas — The recent experimental realization of spin-orbit coupling for ultra-cold atomic gases provides a new powerful platform for exploring many interesting quantum phenomena. Here the spin represents spin-vector (spin-1/2 or spin-1) and orbit represents linear momentum. We propose a scheme to realize a new type coupling between spin-tensor and linear momentum in spin-1 ultra-cold atomic gases. We study ground state properties of such spin-tensor-momentum-coupled Bose-Einstein condensates (BECs) and find interesting stripe superfluid phases that have not been explored in previous spin-orbit coupled BECs. A dynamical process to generate stripe phases with a tunable period of spin-density modulations is discussed.

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