

Abstract Submitted
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Spatial localization due to the interaction between convection and a large scale mode¹ HSIEN-CHING KAO, EDGAR KNOBLOCH, UC Berkeley, Department of Physics — Spatially modulated states are of considerable interest in both rotating convection [1] and in magnetoconvection [2]. The formation of such states is due to the interaction between convective rolls and a large scale phase-like mode [3]: zonal velocity in rotating convection and magnetic potential in magnetoconvection. We have developed a higher order theory to describe the effects of spatial modulation near a certain codimension-two point where the leading order theory breaks down [1]. The theory leads to a fifth order Ginzburg-Landau equation with nonlocal terms. The properties of this equation are analyzed and the solutions used to explain the properties of spatially localized convectons in the full system determined numerically in [1,2].

[1] C. Beaume et al., submitted to J. Fluid Mech. (2012)

[2] D. Lo Jacono, A. Bergeon and E. Knobloch, J. Fluid Mech. 687, 595 (2011)

[3] S. M. Cox and P. C. Matthews, Physica D 149, 210229 (2001)

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Hsien-Ching Kao
UC Berkeley, Department of Physics

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