**Instabilities and motion of tilt grain boundaries in three dimensional stripe patterns** ZHI-FENG HUANG, JORGE VINALS, McGill Institute for Advanced Materials and Department of Physics, McGill University, Canada — Unlike two dimensional tilt boundaries in stripe phases for which stationary solutions are known to exist, the three dimensional case is generally unstable. We study the appropriate amplitude equations in the weakly nonlinear regime close to onset, and find a finite wavenumber, anisotropic instability with wavevector along the grain boundary plane. The characteristic wavelength is larger than that of the base stripe pattern. Our study reveals that this new three dimensional instability originates from a phase perturbation of the base periodic modes, as well as from the cross coupling between orthogonal base modes around the grain boundary region. Our results are in agreement with experimental findings in three dimensional lamellar diblock copolymers.

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