1106-00-2561 **Khanh P Nguyen*** (kpnguyen21@yahoo.com), 12218 North Palm Lake Dr., Houston, TX 77034, and **Zachary Kilpatrick**. *Dynamics of bump attractors in a model of spatial navigation.*

We explore a mathematical model of mammalian neuronal activity during spatial navigation, which takes the form of a neural field. Neural fields are integro-differential equations whose integral describes the connectivity between neurons in a network. Commonly, the kernel of this integral is taken to be distance dependent, so the equation is translational invariant. Activity encoding the remembered location of an animal's position is represented by pulse (bump) solutions to the neural field. By altering the kernel of the integral term, we explore how the architecture of the network impacts the bump's position, breaking the translation invariance of the network. In particular, we study the impact of spatial heterogeneity using perturbation theory, which allows us to derive an effective equation for the dynamics of the bump's position. We uncover two mechanisms that can improve the reliability of a network's position encoding: (a) slower timescales of neural integration and (b) periodic spatial heterogeneity in the connectivity of the network. Our results suggest features of networks in the brain that can improve the way animals encode information about space. (Received September 16, 2014)