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Stimulation reveals structural drivers of dynamic brain reorganization SARAH MULDOON, Univ of Pennsylvania and US Army Research Laboratory, JEAN VETTEL, US Army Research Laboratory, DANIELLE BASSETT, Univ of Pennsylvania — Understanding the brain as a complex network of interacting components can provide insight into cognitive function. From this perspective, one can study two types of networks: the anatomical network composed of physical connections between neurons or brain regions, and the functional networks constructed from coherent neurophysiological activity. However, the relationship between these two types of networks is far from understood. Do underlying anatomical networks drive functional networks and if so how? Theoretical predictions from linear models suggest that stimulation of certain brain regions can more easily move the brain into different states, forming a type of "control." Yet, the brain is far from a linear system. Using a nonlinear model of brain activity derived from diffusion spectrum imaging of white matter connectivity and Wilson-Cowan dynamics, we test the relationship between regional connectivity patterns and the ability of regional stimulation to impart change in functional network configurations. We find that local regional connectivity relates to network controllability and that the system is sensitive to perturbations in the underlying network structure.

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