1145-92-2295 **Nakeya D Williams*** (nakeya.williams@usma.edu), Cornwall, NY 12518. *Cardiovascular dynamics during orthostatic stress assessed via pulsatile and non-pulsatile models.* Preliminary report.

This study develops non-pulsatile and pulsatile models for prediction of blood flow and pressure during orthostatic stress. The head-up tilt (HUT) test is used to diagnose potential pathologies due to orthostatic stress within the autonomic control system, which acts to keep the cardiovascular system at homeostasis. Mathematical modeling is utilized to predict changes in cardiac contractility, vascular resistance, and arterial compliance, quantities that cannot be measured, but are useful to assess the system's state. These quantities are predicted as time-varying parameters modeled using piecewise linear splines. Having models with various levels of complexity formulated with a common set of parameters, allows us to combine long-term non-pulsatile simulations with pulsatile simulations on a shorter time-scale. Results show that if volume data is available for all vascular compartments three parameters can be identified, cardiovascular resistance, vascular compliance, and ventricular contractility, whereas if model predictions are made against arterial pressure and cardiac output data alone, only two parameters can be estimated either resistance and contractility or resistance and compliance. (Received September 25, 2018)