1113-92-86 **Mette S Olufse*** (msolufse@ncsu.edu), Department of Mathematics, 2108 SAS Hall, 2311 Stinson Drive, Raleigh, NC 27695. *Patient specific modeling of cardiovascular system dynamics.*

Cardiovascular models have reached a fairly complex level, yet they have not been used widely within the medical community. One obstacles is the lack of methodologies for rendering models patient specific. To do so it is necessary to adapt models to the specific system studied. This is a complex task given the large inter-individual variation within patients. Moreover, typically only a few quantities can be measured. This talk focus on using sensitivity and correlation analysis to predict a set of identifiable parameters that can be estimated given the model and available data. These techniques will be illustrated using a model predicting baroreflex regulation during head-up tilt. This model can be described by systems of nonlinear ODEs, with parameters representing physiological quantities. Nominal parameter values are predicted using available patient knowledge and the identifiable parameters are estimated allowing the model to predict measured output. Emphasis is placed on ensuring that states for which data is not available are within physiological bounds. Finally, we show that parameter estimates along with model predictions can be compared within and between groups of subjects, leading the way for development of improved diagnosis and treatment protocols. (Received August 17, 2015)