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**Shiyun Tang\*** (tsy@ou.edu), **Xiangming Xiao**, **Maria C.A. Leite**, **Meijun Zhu**, **Yueling Shu** and **Tao Chen**. *Modeling Seasonal Dynamics and Spatial Patterns of Seasonal Influenza at the Global Scale*. Preliminary report.

Based on the hypothesis that climate - influenza virus - human interactions determine the seasonal dynamics of influenza transmissions in a year at various geographical regions, we introduce an approach to analyze seasonal dynamics and inter-annual variation of influenza transmission across latitudinal gradient. In particular, we will discuss mathematical epidemiological models (SEIRS) that incorporate three ecology-based response functions: influenza virus survival and human susceptibility response to air temperature, and influenza virus transmission response to specific humidity. Results for single cities as well as global scale simulation will be presented. Interestingly, the model reproduce not only the reported two peaks (winter - and summer peaks) of influenza in subtropical region, but also the observed temporal pattern of flu in temperate regions (one winter peak). The global simulations results will illustrate how the model can help to explore possible mechanism for the global circulation of the influenza and to better understand the circulation over the globe. (Received September 16, 2014)