

1035-60-1583

Timothy M DelSole* (delsole@cola.iges.org), 4041 Powder Mill Rd., Suite 302, Calverton, MD 20705. *Stochastic Climate Models*.

A fundamental question in climate change research is whether observed changes in the climate are due to natural fluctuations or to man-made changes in greenhouse gases. This question can be formulated as a signal processing problem if the space-time structure of the natural variability and the response to time-varying forcing are known. In practice, these quantities are unknown and therefore estimated from general circulation models, which simulate detailed weather patterns on hourly time scales to produce long data sets from which these quantities can be estimated. This approach is computationally demanding and therefore limited. An attractive alternative approach is to estimate these quantities from stochastic models, since these models can solve for statistical moments directly without simulating the detailed weather patterns. However, the construction of physically sound stochastic models that simulate both the forced response of the climate system and its natural variability is a challenging problem. This talk will review the development of these types of stochastic climate models, and emphasize certain outstanding mathematical and physical problems with these models whose solution could have an impact on climate change research. (Received September 20, 2007)