
GOONG CHEN, Math. Dept., Texas A&M University
Modeling and Computation of Modal Analysis of Coronavirus

In this talk, we present our preliminary study on the modeling and supercomputer simulation of the normal modes of vibration of a coronavirus. The virus is modeled as an elastodynamic continuum. We take "samples" of coronavirus from the Internet resources. The vibratory mode shapes, as shown from post-processed supercomputer results as videos, manifest the fundamental motions from a small number of spikes to those of a higher number of spikes. As the mode sequential order increases, one can see more "breathing modes" in occurrence. At present, we are attempting to incorporate the effects of fluids (such as blood or body fluids) in the model and investigate how such vibratory motions lead to coupled motions between two or more viruses. All the modal analysis of virus vibratory motions will be visualized by video animations. Their significance is also being investigated.