## 1085-37-239

**Rafail V Abramov\***, Mathematics, Statistics and Computer Science, 322 SEO, 851 S. Morgan st. (M/C 249), Chicago, IL 60607. A simple closure approximation for slow dynamics of a multiscale system: nonlinear and multiplicative coupling.

In this work we develop a new method for reduced models of multiscale systems, based on the linear fluctuation-dissipation theorem applied to statistical states of the fast variables. The method is suitable for situations with quadratically nonlinear and multiplicative coupling. We test the new method on the two-scale Lorenz 96 system and show that, with complex quadratically nonlinear and multiplicative coupling in both slow and fast variables, the reduced model produces comparable statistics to what is exhibited by the original two-scale system. (Received September 10, 2012)