

The nonlinear theory of oscillating systems has revealed new aspects in the study of variable stars. In addition to the comparison of linear periods and the estimate of stability, the appearance and disappearance of possible modes are studied in detail. It provides a new tool in the study of variable astrophysical objects. While nonlinearity in stellar pulsations is not a very complicated concept, it generally requires extensive and sometimes sophisticated numerical studies. The development of appropriate computational tools allowed us to apply the nonlinear theory to real phenomena in variable stars. The International Astronomical Union Colloquium No. 134 served as an overview of the new frontiers of variable star studies which will encourage further development in this field.

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