

SENSITIVITY OF ATTRACTOR TO EXTERNAL INFLUENCES: APPROACH BY UNSTABLE PERIODIC ORBITS.

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A description of a deterministic chaotic system in terms of unstable periodic orbits (UPO) is used to develop a method of an a priori estimates of the sensitivity of statistical averages of the solution to small external influences. This method allows us to determine the forcing perturbation which maximizes the norm of the perturbation of a statistical moment of the solution on the attractor. The method was applied to the Lorenz model. The estimates of perturbations of two statistical moments were compared with directly calculated values. The comparison shows that some 100 UPOs are sufficient to realize this approach and to get a good accuracy. The linear approach remains valid up to rather high norms of the forcing perturbation.