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Title: A study of chaos for processes under small perturbations

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The method of isolating segments was developed to prove topological chaos (positive topological entropy) for Poincaré maps of time-periodic processes. The authors recently proved that it may also be used to verify distributional chaos, when the obtained semi-conjugacy covers a periodic point exactly one to one (so the solution giving raise to this preimage is also periodic). When we make a small perturbation of dynamics then usually the same isolating segments may be used (and as a result the same semi-conjugacy but possibly on a different set is obtained), however the periodic solution may be destroyed (then we have infinite set in the preimage), or if we are lucky, it may bifurcate to a finite number of periodic solutions. In this article we cover the case when two periodic solutions are continued from the previous one. We prove that in this case distributional chaos survives. Homoclinic and heteroclinic connections between these two solutions are also discussed.

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