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Breakup of Central Meanders and Outer Shearless Tori in the Standard Nontwist Map K. FUCHSS, Inst. for Fusion Studies, U. of Texas at Austin, A. WURM, Dept. of Physical and Biological Sciences, Western New England College, A. APTE, Dept. of Mathematics, U. of North Carolina at Chapel Hill, P.J. MORRISON, Inst. for Fusion Studies, U. of Texas at Austin — The standard nontwist map, a simple model for degenerate Hamiltonian systems, e.g., magnetic field lines in toroidal plasma devices with reversed magnetic shear profile, is a useful tool for studying the breakup of shearless orbits in such systems in a numerically feasible way. In the past, the breakup of several shearless orbits with noble winding numbers has been studied for this map. [1,2] Here, we conduct similar breakup studies in a parameter range where a shearless orbit of meander shape is encountered, a type of orbit that is exclusively found in nontwist systems. Further, in contrast to previous studies, multiple shearless orbits can exist for certain winding numbers. The breakup of such additional "outer orbits" is examined here as well.

[1] D. del Castillo-Negrete, J.M. Greene, and P.J. Morrison, Physica D 91, 1 (1996);

[2] A. Apte, A. Wurm, and P.J. Morrison, Chaos 13, 421 (2003)

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