

# Fixed points, periodic points and chaotic-like dynamics for contractive-expansive mappings

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We study the topological dynamics associated to some planar mappings which satisfy a stretching condition along the paths on two-dimensional cells. The results are motivated by the study of the Poincaré map associated to some nonlinear Hill equations with a sign-indefinite weight and in this case we prove, under certain assumptions, the existence of a complex behavior for the solutions.

Partial extensions are then given to  $N$ -dimensional cells and we also show some connections of our work with older and recent results about fixed points for dissipative-repulsive systems and topological horseshoes.

The results we present have been obtained in collaboration with Duccio Papini (Univ. Siena) and Marina Pireddu (Univ. Udine).