An infinite-dimensional version
of the Poincaré-Birkhoff theorem on the Hilbert cube

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To the memory of Maria Gramegna (1887–1915)

Abstract. We propose a version of the Poincaré–Birkhoff theorem for infinite-dimensional Hamiltonian systems, which extends a recent result by Fonda and Ureña [20]. The twist condition, adapted to a Hilbert cube, is spread on a sequence of approximating finite-dimensional systems. Some applications are proposed to pendulum-like systems of infinitely many ODEs. We also extend to the infinite-dimensional setting a celebrated theorem by Conley and Zehnder [9].