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**Existence of orbits homoclinic to an elliptic equilibrium, for a reversible system. (Existence d'orbites homoclines à un équilibre elliptique, pour un système réversible.)** (French)

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C. R. Acad. Sci., Paris, Sér. I 324, No. 9, 993-997 (1997).

Summary: We consider a reversible vector field in  $\mathbb{R}^4$ , where the origin is a critical point, and where the differential at the origin has a pair of double non semisimple pure imaginary eigenvalues  $\pm i\omega$ . We assume that the coefficient  $\varepsilon$  of a cubic term of the normal form is positive and close to 0, and that a certain coefficient of order 5 is negative. Then we show that there exist two reversible orbits homoclinic to the origin, of size  $\sqrt{\varepsilon}$  and such that they oscillate with a damping in  $1/t$  when  $t$  tends towards  $\pm\infty$ . For obtaining such a result, we give explicitly the inverse of the linearized operator around the reversible homoclinics of the normal form, and solve the problem by a fixed point argument.

**MSC:**

34C37 Homoclinic and heteroclinic solutions to ordinary differential equations

37C80 Symmetries, equivariant dynamical systems (MSC2010)

37G05 Normal forms for dynamical systems

Cited in **3** Documents

**Keywords:**

reversible vector field in  $\mathbb{R}^4$ ; homoclinic; pair of double non semisimple pure imaginary eigenvalues; two reversible orbits homoclinic; fixed point argument

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