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# APPLIED MATHEMATICS seminar

## BREAKDOWN OF SMALL AMPLITUDE BREATHERS FOR THE REVERSIBLE KLEIN-GORDON EQUATION

**SPEAKER:** Tere M-Seara (Universitat Politècnica de Catalunya)

**DATE:** Tuesday, January 21, 2020

15:00 - **Seminar**

16:00 - **Discussion group**: "Scattering atom-superficie corrugada como modelo realista del scattering map (?)", Javier Montes (UAM)

**VENUE:** Aula Naranja, ICMAT

**ABSTRACT:** Breathers are periodic in time spatially localized solutions of evolutionary PDEs. They are known to exist for the sine-Gordon equation but are believed to be rare in other Klein-Gordon equations. Breathers can be interpreted as homoclinic solutions to a steady solution in an infinite dimensional space. In this talk, we prove an asymptotic formula for the distance between the stable and unstable manifold of the steady solution when the steady solution has weakly hyperbolic one dimensional stable and unstable manifolds.
This formula allows to say that for a wide set of Klein-Gordon equations breathers do not exist.
The distance is exponentially small with respect to the amplitude of the breather and therefore classical perturbative techniques cannot be applied.

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