

Homogenization of the wave equation.

Faustino Maestre

Faustino Maestre (fmaestre@us.es)
Universidad de Sevilla

Juan Casado-Díaz, Julio Couce-Calvo, José D. Martín-Gómez (jcasadod@us.es,
couce@us.es, jdmartin@us.es)
Universidad de Sevilla

Abstract.

We are interested in the homogenization of the wave equation, this kind of problems have been considered in different papers ([1],[3]).

Assuming regularity on time variables (see [2]) we generalize typical homogenization results obtained for elliptic problems. In order to get strong approximations for the solution of the limit problem, a corrector, we need consider smoother data, proving with a counter-example the optimality of this conditions.

On the other hand, using two-scale convergence we prove the existence of a non-local corrector and that the limit problem is non-local in general.

References

- [1] Brahim-Otsmane, S., Francfort, G.A., Murat, F. . “Correctors for the homogenization of the wave and heat equations”. *J. Math. Pures Appl.* **71** (1992), 197-231.
- [2] Casado-Daz, J. et al. “Homogenization and corrector for the wave equation with discontinuous coefficients in time”, *J. Math. Appl* **379** (2011), no.2, 664 - 681.
- [3] Colombini,F., Spagnolo, S.. “On the convergence of solutions of hyperbolic equations”. *Comm. Partial Differential Equations* **3** (1978), 77-103.