

Bisognin, E.; Bisognin, V.; Coimbra Charão, R.; Pazoto, A. F.

Asymptotic expansion for a dissipative Benjamin–Bona–Mahony equation with periodic coefficients. (English) [Zbl 1102.35074](#)

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Summary: In this work we study the asymptotic behavior of solutions of a dissipative BBM equation in \mathbb{R}^N with periodic coefficients

$$\rho(x)u_t - \frac{\partial}{\partial x_j} \left(a_{jk}(x) \frac{\partial^2 u}{\partial x_k \partial t} \right) - \nu \frac{\partial}{\partial x_j} \left(a_{jk}(x) \frac{\partial u}{\partial x_k} \right) = 0. \quad (*)$$

Here ν is a positive constant and Einstein's convention is used. Moreover, the coefficient $\rho(x)$ is strictly positive and periodic, and the coefficient matrix $(a_{jk}(x))$ is uniformly positive definite and periodic.

We use Bloch waves decomposition to obtain a complete expansion, as $t \rightarrow +\infty$, and conclude that the solutions behave, in a first approximation, as the homogenized heat kernel.

MSC:

[35Q53](#) KdV equations (Korteweg-de Vries equations)

[35C20](#) Asymptotic expansions of solutions to PDEs

Cited in **2** Documents

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