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Abstracts of Short Communications and Posters

Section:

10. Partial Differential Equations

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A Foias-Saut type of expansion for a dissipative wave equation

Consider in a bounded domain the nonlinear wave equation $u_{tt} - \triangle u + au_t + bu = f(u)$ complemented with the boundary condition $u = 0$, where $a > 0$, $f(u) = O(u^2)$ as $u \to 0$. If the spectrum $\sigma(L)$ of the generator L of the linear semigroup associated to this problem satisfies a nonresonant condition, then every small solution $u(t)$ admits a Foias-Saut type of expansion $\sum_{\mu\in\Pi(L)} e^{-\mu t} w_\mu(x)$, where $\Pi(L)$ is the additive semigroup generated by $\sigma(L)$, such that $\forall\Lambda > 0$, $u(t) - \sum_{\mu\in\Pi(L),\Re\mu\le\Lambda} e^{-\mu t} w_\mu(x) = o(e^{-\Lambda t})$, as $t \to +\infty$, and $\forall\mu \in \sigma(L)$, $\{w_\mu(x), \mu w_\mu(x)\}$ belongs to the eigenspace of μ.