Marti, Jean-Andre

$(\mathcal{C}, \mathcal{E}, \mathcal{P})$-sheaf structures and applications. (English) Zbl 0938.35008

Grosser, Michael (ed.) et al., Nonlinear theory of generalized functions. Proceedings of the workshop on nonlinear theory of nonlinear functions, Erwin-Schrödinger-Institute, Vienna, Austria, October-December 1997. Boca Raton, FL: Chapman & Hall. Chapman Hall/CRC Res. Notes Math. 401, 175-186 (1999).

The author constructs a sheaf $\mathcal{A}$ of $(\mathcal{C}, \mathcal{E}, \mathcal{P})$-algebras, where $\mathcal{C}$ denotes a ring of generalized numbers, $\mathcal{E}$ a sheaf of algebras on a topological space X and, with Ω ranging in the open subsets of X, $\mathcal{P}(\Omega)$ a family of seminorms on $\mathcal{E}(\Omega)$. $\mathcal{A}$ generalizes many previous approaches in the theory of generalized functions. The sheaf structure allows one to define localization and microlocalization. The author then gives applications to a perturbation problem of the kind

$$\varphi(\varepsilon)dX/dt = f_\varepsilon(t, X), \quad X(0) = \psi(\varepsilon),$$

upon suitably interpreting the problem as a fixed point problem in some algebras whose parameters $(\mathcal{C}, \mathcal{E}, \mathcal{P})$ are adjusted to the perturbation.

For the entire collection see [Zbl 0918.00026].

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MSC:

35A27 Microlocal methods and methods of sheaf theory and homological algebra applied to PDEs
32C38 Sheaves of differential operators and their modules, D-modules

Keywords:

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