

Injectivity and flatness of semitopological modules

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The spaces D , S and E' over \mathbb{R}^n are known to be flat modules over $A=\mathbb{C}[\partial_1, \dots, \partial_n]$, whereas their duals D' , S' and E are known to be injective modules over the same ring. Let A be a Noetherian k -algebra ($k=\mathbb{R}$ or \mathbb{C}). The above observation leads us to study in this paper the link existing between the flatness of an A -module E which is a locally convex topological k -vector space and the injectivity of its dual. We show that, for dual pairs (E, E') which are (K) over A --a notion which is explained in the paper--, injectivity of E' is a stronger condition than flatness of E . A preprint of this paper (dated September 2009) has been quoted and discussed by Shankar.

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