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Locally realcompact and HN-complete spaces

Abstract: Two classes of spaces are studied, namely locally realcompact spaces and HN-complete spaces, where the latter class is introduced in the paper. Both of these classes are superclasses of the class of realcompact spaces. Invariance with respect to subspaces and products of these spaces are investigated. It is shown that these two classes can be characterized by demanding that certain equivalences hold between certain classes of Baire measures or by demanding that certain classes of Baire measures have non empty support. It is known that a space is locally realcompact if and only if it is open in its Hewitt-Nachbin realcompactification; we give an external characterization of HN-completeness with respect to the Hewitt-Nachbin realcompactification. In addition, a complete characterization of products of these classes is given.