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Relative normality and product spaces

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Abstract: Arhangel'skiĭ defines in [Topology Appl. 70 (1996), 87–99], as one of various notions on relative topological properties, strong normality of A in X for a subspace A of a topological space X, and shows that this is equivalent to normality of X_A, where X_A denotes the space obtained from X by making each point of $X \setminus A$ isolated. In this paper we investigate for a space X, its subspace A and a space Y the normality of the product $X_A \times Y$ in connection with the normality of $(X \times Y)_{(A \times Y)}$. The cases for paracompactness, more generally, for γ-paracompactness will also be discussed for $X_A \times Y$. As an application, we prove that for a metric space X with $A \subset X$ and a countably paracompact normal space Y, $X_A \times Y$ is normal if and only if $X_A \times Y$ is countably paracompact.

Keywords: strongly normal in, normal, γ-paracompact, product spaces, weak C-embedding
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