Topologies and smooth maps on initial and final objects in the category of Frolicher spaces: product and coproduct

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In this talk, we show that when the Frölicher smooth structure is induced on a product or a coproduct, there are three natural topologies underlying the resulting object. We study these topologies and compare them in each case. We show that on a product space the product topology is equal to the Frölicher topology. However, the three topologies are equal on the coproduct space. We end this paper by comparing topologies on the tangent bundle TM of a Frölicher space M.