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On monads of (the dual) Kock-Zöberlein type in topology

A monad (T, m, e) on an order-enriched category is of Kock-Zöberlein type if T is locally monotone and $Te_X \leq e_{TX}$. This property of a monad is very convenient since it allows a description of their algebras as precisely the injectives with respect to a certain class of morphisms. There is an extensive literature on this type of monads on Top (typically submonads of the filter monad); however, monads satisfying the dual condition $Te_X \geq e_{TX}$ seem to be less frequent in topology. Having as starting point the Vietoris monad, in this talk we will have a closer look at some of these. If time permits, we will also give a characterisation of the morphisms of the Kleisli category of the Vietoris monad, and show how the notion of an Esakia space arises naturally in this context via splitting idempotents.