Some categorical aspects of coarse spaces and balleans

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Roe's coarse spaces and Protasov's balleans are known to be equivalent constructions describing large scale geometry of spaces. The talk is focused on two categories: the category **Coarse**, which has these structures as objects and bornologous maps as morphisms, and its quotient category **Coarse**/$_\sim$, where $\sim$ is the closeness relation between morphisms. We show that the category **Coarse** is topological, so that the description of its monomorphisms and epimorphisms is well known. Moreover we provide an explicit description of some categorical constructions in **Coarse** such as products, coproducts and quotients (of those the last case is quite delicate and requires particular attention). This allows us to describe, among others, the monomorphisms and the epimorphisms in **Coarse**/$_\sim$ and deduce that the category **Coarse**/$_\sim$ is balanced, since its bimorphisms are precisely the isomorphisms, namely the coarse equivalences.