Martin Szyld - **On flat functors**

The notion of flat module has a classic generalization to set-valued functors $C \xrightarrow{F} \mathcal{E}ns$ ([1], [2]). The main theorem of that theory expresses the equivalences

i) F is flat.

ii) F is a filtered colimit of representable functors.

iii) The diagram of F is a filtered category.

For an arbitrary *base* category $\mathcal{V}$ instead of $\mathcal{E}ns$, Kelly [3] has developed a theory of flat $\mathcal{V}$-enriched functors $C \xrightarrow{F} \mathcal{V}$, but there is no known generalization of the theorem above for any $\mathcal{V}$ other than $\mathcal{E}ns$.

We have established a 2-dimensional version of this theorem, i.e. for a 2-functor $C \xrightarrow{F} Cat$, where C is a 2-category and Cat is the 2-category of categories. As it is usually the case for 2-categories, the Cat-enriched notion of limit isn't adequate for most purposes and the *relaxed* bi and pseudo notions are the important ones. We will explain these concepts, review the theories mentioned above and present our theorem.

This is joint work with Maria Emilia Descotte and Eduardo J. Dubuc.

References

[1] Artin M., Grothendieck A., Verdier J., *SGA 4, Ch IV*, Springer Lecture Notes in Mathematics 269 (1972).

[2] Mac Lane S., Moerdijk I, *Sheaves in Geometry and Logic: a First Introduction to Topos Theory*, Springer, New York, (1992).

[3] Kelly G. M., *Structures defined by finite limits in the enriched context I*, Cahiers de Topologie et Géométrie Différentielle Catégoriques 23 (1982).