The infinite décalage construction

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One of the main questions when working with spectral sequences is: Is the spectral sequence computing what we want it to compute? This is the question of convergence of spectral sequences. In practice, strong convergence is necessary for actual computation since it means that the abutment (what we want to compute) can be recovered from the spectral sequence in the strongest possible sense. Whenever one is dealing with a spectral sequence obtained from a complete filtration, Boardman observes that one does not always have strong convergence. Instead, he calls the associated spectral sequence conditionally convergent. He then exhibits two additional obstructions to strong convergence: the derived limit page and Boardman's obstruction group.

In this talk, I want to explain the infinite décalage construction.In the same way as iterated décalage construction provides a homotopy-theoretic incarnation of the different pages of the spectral sequence, the infinite décalage construction provides us with a homotopy-theoretic incarnation of the (derived) limit page of the spectral sequence. The infinite décalage construction turns out to capture both the information available in the derived limit page and Boardman's obstruction group. This is joint work with A. Krause and T. Nikolaus.