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PIECEWISE LINEAR APPROXIMATE FIBRATIONS

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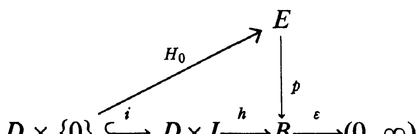
ABSTRACT. A pl map is an approximate fibration if and only if all the maps of any iterated mapping cylinder decomposition are homotopy equivalences. This leads to a classifying space.

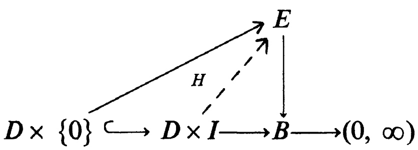
In this paper we provide a local characterization for piecewise linear maps which are also approximate fibrations. We use the approach taken by A. E. Hatcher in [5] to apply his higher simple homotopy theory to the classification of PL fibrations. This leads to a classifying space for PL approximate fibrations. All of the proofs are elementary but, hopefully, the results have sufficient intrinsic interest to justify themselves.

I. Local characterization. We begin with a few basic definitions and assumptions. All metric spaces will be equipped with a fixed metric, denoted by $d(a, b)$. In the case of the unit interval, $I = [0, 1]$, the metric is the usual absolute value of $a - b$.

DEFINITION I.1. (See [1].) A proper surjection p: $E \to B$ of metric spaces is an approximate fibration if, for every metric space D, every lifting problem



has an approximate solution



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