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The Topology of Limits of Direct Systems Induced by Maps

Abstract. Let Z, H be spaces. In previous work, we introduced the direct system $\mathbf{X}$ induced by the set of maps between the spaces Z and H. The coordinate spaces of this system are simply finite unions of graphs of maps. A connecting map is just the inclusion of one finite union of graphs into a finite union of a larger set of graphs.

Now we will consider the case that $\mathbf{X}$ is induced by a possibly proper subset of the maps of Z to H. The direct limit X of such a system is the union of the graphs of the set of maps, $X \subset Z \times H$, but the topology of X is not the one inherited from $Z \times H$. This will be explained in our talk. Our objective is to explore conditions under which X will be T_1, Hausdorff, regular, completely regular, pseudo-compact, normal, an absolute co-extensor for some space K, or will enjoy some combination of these properties.

We will also speculate on what could develop from a direct system where the connecting maps are not inclusions, but are only embeddings. Even though such a system is equivalent to one in which the connecting maps are inclusions, there seems to be no value in treating it that way unless one could find a "useful" space (such as $Z \times H$ above) that contains all the coordinate spaces simultaneously and in which the embeddings are actually inclusions.