Polyhedral expansions and cell structures

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Abstract: For a topologically complete space X and a family of closed normal covers $\mathcal{A}$ of X satisfying a local refinement condition and a completeness condition we give a construction of an inverse system $N_{\mathcal{A}}$ of simplicial complexes with simplicial bonding maps such that the limit space $N_{\infty} = \varprojlim N_{\mathcal{A}}$ is homotopy equivalent to X. The cell structures defined recently by Dębski and Tymchatyn can be used to obtain the space N_{∞}. Further, if X is compact and Hausdorff then the cell structures induce a polyhedral expansion of X in the sense of shape theory.