

Homology Localization by Hierarchical Blowups

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- Hierarchical Cover

$$\mathcal{C}_h \rightarrow \dots \rightarrow \mathcal{C}_1 = \mathcal{C}$$

- Mayer-Vietoris Blowup

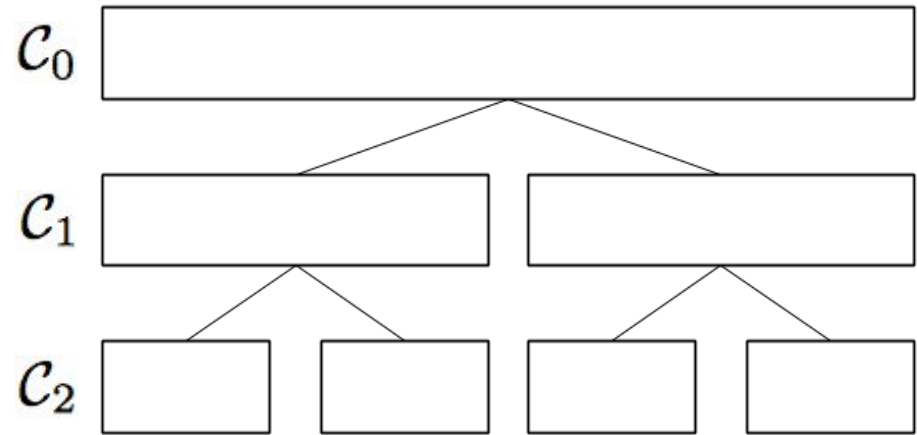
$$\mathcal{K}^{\mathcal{C}} = \{(\sigma, s) \mid \sigma \in \mathcal{K}, s \subseteq \mathcal{C}, \sigma \in \cap s\}$$

- Hierarchical Blowup

$$\mathcal{K}^{\mathcal{H}_1} = \mathcal{K}^{\mathcal{C}_1}$$

$$\mathcal{K}^{\mathcal{H}_{i+1}} = (\mathcal{K}^{\mathcal{H}_i})^{\hat{\mathcal{C}}_{i+1}}$$

- Range Queries?



$$\begin{array}{ccccccc}
 H(K_1) & \longrightarrow & \dots & \longrightarrow & H(K_i) & \longrightarrow & \dots & \longrightarrow & H(K_n) \\
 \uparrow \pi_{1,1}^* & & & & \uparrow \pi_{1,i}^* & & & & \uparrow \pi_{1,n}^* \\
 H(K_1^{\mathcal{H}_1}) & \longrightarrow & \dots & \longrightarrow & H(K_i^{\mathcal{H}_1}) & \longrightarrow & \dots & \longrightarrow & H(K_n^{\mathcal{H}_1}) \\
 \uparrow \pi_{2,1}^* & & & & \uparrow \pi_{2,i}^* & & & & \uparrow \pi_{2,n}^* \\
 H(K_1^{\mathcal{H}_2}) & \longrightarrow & \dots & \longrightarrow & H(K_i^{\mathcal{H}_2}) & \longrightarrow & \dots & \longrightarrow & H(K_n^{\mathcal{H}_2})
 \end{array}$$