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Jerrold R Griggs* (j@sc.edu), Department of Mathematics, University of South Carolina, Columbia, SC 29208. *On diamonds in the middle three layers.* Preliminary report.

: It interesting to study the maximum size of a family of subsets of an n -set that contains no (weak) copy of a given poset P , denote this $La(n, P)$. It is conjectured that $La(n, P)$ is asymptotic to $\binom{n}{\lfloor n/2 \rfloor}$ times some integer depending on P , as $n \rightarrow \infty$. While this has been proven for several posets P , it remains a tough challenge, even for the four-element diamond poset. Restricting attention to just the middle three levels, the no-diamond problem is that of bounding the largest size of a family of vertices in the middle three slices of the hypercube that induces no C_4 . We discuss the current status of this problem, which remains open, and share ideas for the deeper understanding of the connections between the middle layers. This is in part joint work with Cliff Smythe. (Received August 31, 2016)