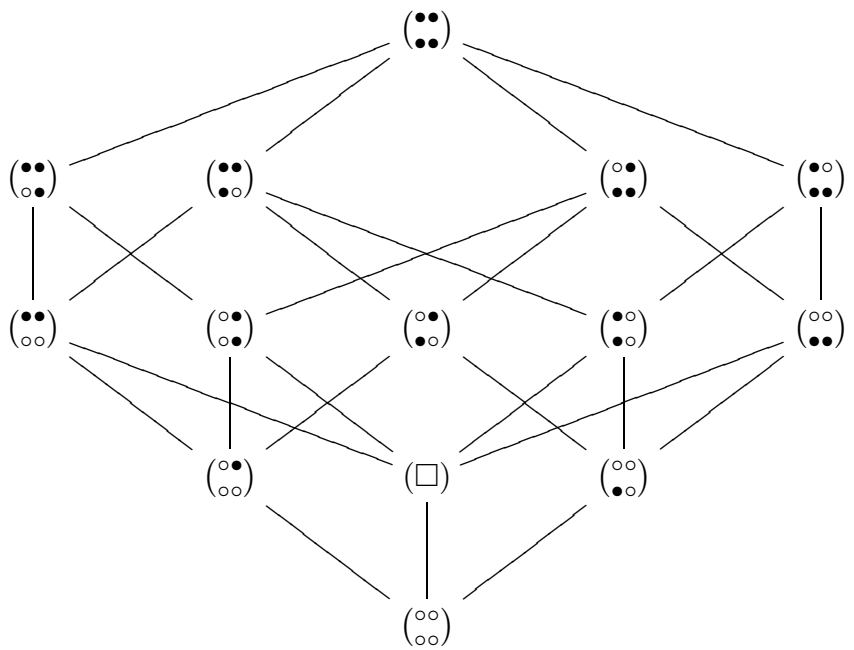
The lattice of $\mathcal{H}$-prime ideals of $\mathcal{O}_q(M_2(k))$ is displayed below. The symbols $\bullet$ and $\circ$ stand for generators X_{ij} which are or are not included in a given prime, and $\square$ stands for the 2×2 quantum determinant. For example, $\left(\begin{smallmatrix}\circ & \bullet \\ \bullet & \circ\end{smallmatrix}\right)$ stands for the ideal $\langle X_{12}, X_{21}\rangle$, and $(\square)$ stands for the ideal $\langle X_{11}X_{22} - qX_{12}X_{21}\rangle$.

The corresponding $\mathcal{H}$-strata in $\operatorname{spec}\mathcal{O}_q(M_2(k))$ can be easily calculated. For instance, if q is not a root of unity, the strata corresponding to $\left(\begin{smallmatrix}\circ & \circ \\ \circ & \circ\end{smallmatrix}\right)$ and $\left(\begin{smallmatrix}\circ & \bullet \\ \bullet & \circ\end{smallmatrix}\right)$ are 2-dimensional, the strata corresponding to $\left(\begin{smallmatrix}\bullet & \bullet \\ \circ & \bullet\end{smallmatrix}\right)$, $\left(\begin{smallmatrix}\bullet & \bullet \\ \bullet & \circ\end{smallmatrix}\right)$, $\left(\begin{smallmatrix}\circ & \bullet \\ \bullet & \bullet\end{smallmatrix}\right)$, and $\left(\begin{smallmatrix}\bullet & \circ \\ \bullet & \bullet\end{smallmatrix}\right)$ are all 1-dimensional, and the remaining 8 strata are singletons.



$\mathcal{H}$-spec $\mathcal{O}_q(M_2(k))$

(This is taken from the paper "Prime ideals in certain quantum determinantal rings" by K R Goodearl and T H Lenagan.)