1121-15-268 **Samuel E Swain*** (sswain@bowdoin.edu). *Kochen-Specker Uncolorability of $\mathbb{Z}_{5^n}$.*

The Kochen-Specker theorem from quantum physics restricts noncontextual hidden variable theories by demonstrating that, for certain collections of real projection matrices, a coloring does not exist. A Kochen-Specker coloring of 3x3 symmetric idempotent (projection) matrices over a commutative ring assigns the color black or white to every matrix in such a way that every set of commeasurable elements has one white matrix and the rest black. These triples of commeasurable elements are those that commute with each other, that is, projections onto orthogonal subspaces. We will show that there is no such coloring for the matrices with entries from $\mathbb{Z}_{5^n}$ for all $n \geq 1$ by showing that the subset of all rank-1 projection matrices is uncolorable. This should ultimately motivate an argument of colorability over $\mathbb{Z}_5$, the 5-adic integers. (Received July 19, 2016)