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Jinseok An and **Thomas Langley*** (langley@rose-hulman.edu). *Sorting permutations with finite-depth stacks and symmetries of the square*. Preliminary report.

We consider several sorting operators built from stack sorting with a finite-depth stack and a symmetry of the square. In particular, we characterize permutations that are sortable by the operator $\mathcal{S}_d \circ r \circ \mathcal{S}_d$ for $d = 2$ and $d = 3$, where \mathcal{S}_d represents stack sorting with a depth- d stack and r denotes reverse. We also conjecture a general result. We then consider the operator $(\mathcal{S}_d \circ r)^k$, characterizing permutations that are sortable with $d = 2$ and $d = 3$, for any value of k . Many open questions will arise. (Received September 22, 2015)