1145-20-1834 **Alexander M. Heaton**, 3200 N. Cramer St., Milwaukee, WI, **Songpon Sriwongsa**, 3200 N. Cramer St., Milwaukee, WI 53211, and **Jeb F. Willenbring*** (jw@uwm.edu), 3200 N. Cramer St., Milwaukee, WI 53211. *Embedding $\mathfrak{sl}_k$ in $\mathfrak{sl}_n$ as a small subalgebra and the representations of the symmetric group.* Preliminary report.

In joint work with Gregg Zuckerman the notion of a *small* subalgebra was introduced. That is, given a simple Lie algebra $\mathfrak{g}$ and a simple subalgebra $\mathfrak{k}$, we say that $\mathfrak{k}$ is *small* in $\mathfrak{g}$ if there exists a positive integer b (depending only on $\mathfrak{g}$ and $\mathfrak{k}$) such that in the restriction to $\mathfrak{k}$ of each finite dimensional representation of $\mathfrak{g}$ there exists an irreducible $\mathfrak{k}$-representation of dimension at most b.

We assume the field is $\mathbb{C}$. Let $n \geq 3$. Given any subalgebra, $\mathfrak{k}$, of $\mathfrak{sl}_n$, if $\mathfrak{k} \cong \mathfrak{sl}_2$ then $\mathfrak{k}$ is small in $\mathfrak{sl}_n$. In joint work with Hassan Lhou the speaker found that n is a best possible bound b in this case.

The question of when $\mathfrak{k} \cong \mathfrak{sl}_k$ is small in $\mathfrak{sl}_n$ is related to the notion of plethysm. Using a well understood interpretation of plethysm, we relate the question of small $\mathfrak{k} \cong \mathfrak{sl}_k$ to the representation theory of the symmetric group. (Received September 24, 2018)