1096-20-1637 **Luise-Charlotte Kappe*** (menger@math.binghamton.edu), Department of Mathematical Sciences, Binghamton, NY 13902-6000, and **Daniela Nikolova-Popova** and **Eric Swartz**. *On the covering number of some small symmetric groups and some sporadic simple groups.*

Every group G with a finite non-cyclic homomorphic image is a union of finitely many proper subgroups. The minimal number of subgroups needed to cover G is called the covering number of G, denoted by $\sigma(G)$. Tomkinson showed that for a solvable group G, $\sigma(G) = p^k + 1$, where p is a prime, and he suggested the investigation of the covering number for families of finite non-solvable groups.

For symmetric groups S_n Maroti showed that $\sigma(S_n) = 2^{n-1}$ if n is odd unless $n = 9$ and $\sigma(S_n) \leq 2^{n-2}$ if n is even. We show $\sigma(S_8) = 64$, $\sigma(S_9) = 256$ and $\sigma(S_{10}) = 221$. For the Mathieu group M_{12} we show $\sigma(M_{12}) = 208$ and improve estimates given by Holmes for some other sporadic simple groups. (Received September 16, 2013)