1163-05-1539 **Naiomi Cameron*** (naiomi.cameron@spelman.edu) and **Kendra Killpatrick**. *Inversion generating functions for signed pattern avoiding permutations.*

We consider the classical Mahonian statistics on the set $B_n(\Sigma)$ of signed permutations in the hyperoctahedral group B_n which avoid all patterns in Σ, where Σ is a set of patterns of length two. In 2000, Simion gave the cardinality of $B_n(\Sigma)$ in the cases where Σ contains either one or two patterns of length two and showed that $|B_n(\Sigma)|$ is constant whenever $|\Sigma| = 1$, whereas in most but not all instances where $|\Sigma| = 2$, $|B_n(\Sigma)| = (n+1)!$. We answer an open question of Simion by providing bijections from $B_n(\Sigma)$ to S_{n+1} in these cases where $|B_n(\Sigma)| = (n+1)!$. In addition, we extend Simion's work by providing a combinatorial proof in the language of signed permutations for the major index on $B_n(21, \bar{2}\bar{1})$ and by giving the major index on $D_n(\Sigma)$ for $\Sigma = \{21, \bar{2}\bar{1}\}$ and $\Sigma = \{12, 21\}$. The main result of this paper is to give the inversion generating functions for $B_n(\Sigma)$ for almost all sets Σ with $|\Sigma| \leq 2$. (Received September 15, 2020)