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Alexander Burstein* (aburstein@howard.edu), Department of Mathematics, Howard University, Washington, DC 20059. *Equidistribution of some Euler-Mahonian statistics*. Preliminary report.

We give a direct combinatorial proof of the equidistribution of two pairs of permutation statistics, $(\mathbf{aid}, \mathbf{des})$ and $(\mathbf{inv}, \mathbf{lec})$, which have been previously shown to have the same joint distribution as $(\mathbf{maj}, \mathbf{exc})$, the major index and the number of excedances of a permutation. Moreover, the triple $(\mathbf{inv}, \mathbf{lec}, \mathbf{pix})$ was shown to have the same distribution as $(\mathbf{maj}, \mathbf{exc}, \mathbf{fix})$, where \mathbf{fix} is the number of fixed points of a permutation. We define a new statistic \mathbf{aix} so that our bijection maps $(\mathbf{inv}, \mathbf{lec}, \mathbf{pix})$ to $(\mathbf{aid}, \mathbf{des}, \mathbf{aix})$. We also find an Eulerian partner \mathbf{dis} for a Mahonian statistic \mathbf{mix} defined using mesh patterns, so that $(\mathbf{mix}, \mathbf{dis})$ is equidistributed with $(\mathbf{inv}, \mathbf{des})$. (Received September 25, 2012)