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Pawel Pralat* (pralat@math.wvu.edu), Department of Mathematics, West Virginia University, Morgantown, WV 26506. *Modular orientations of random regular graphs.*

Extending an old conjecture of Tutte, Jaeger conjectured in 1988 that for any fixed integer $p \geq 1$, the edges of any $4p$ -edge connected graph can be oriented so that the difference between the outdegree and the indegree of each vertex is divisible by $2p + 1$. It is known that it suffices to prove this conjecture for $(4p + 1)$ -regular, $4p$ -edge connected graphs. Here we show that there exists a finite p_0 so that for every $p > p_0$ the assertion of the conjecture holds asymptotically almost surely for random $(4p + 1)$ -regular graphs. The proof is based on the spectral properties of these graphs, and applies to (appropriately defined) pseudo-random $(4p + 1)$ -regular graphs as well.

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