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Luke Oeding* (oeding@math.berkeley.edu), Department of Mathematics, University of California, Berkeley, 970 Evans Hall #3840, Berkeley, CA 94720, and **Daniel J Bates**. *Toward a salmon conjecture.*

Methods from numerical algebraic geometry are applied in combination with techniques from classical representation theory to show that the variety of $3 \times 3 \times 4$ -tensors of border rank 4 is cut out by polynomials of degree 6 and 9. Combined with results of Landsberg and Manivel, this furnishes a computational solution of an open problem in algebraic statistics, namely, the set-theoretic version of Allman's Salmon Conjecture for $4 \times 4 \times 4$ -tensors of border rank 4. A proof without numerical computation was given recently by Friedland and Gross. (Received August 23, 2011)