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**S Paul Smith\***, smith@math.washington.edu. *The classification of 3-Calabi-Yau potentials in  $V^{\otimes 3}$  when  $\dim(V) = 3$ .*

This is joint work with Izuru Mori.

Let  $V$  be a 3-dimensional vector space over an algebraically closed field whose characteristic is not 2 or 3. Let  $w$  be a non-zero element in  $V^{\otimes 3}$ . Let  $J(w)$  be the Jacobian algebra, i.e., the quotient of the tensor algebra  $TV$  by the ideal generated by the cyclic partial derivatives of  $w$ . We prove a result of the form  $J(w)$  is a 3-Calabi-Yau algebra if and only if  $w$  is ... The classification is a little intricate but is effective in the sense that if you give me any  $w$ , then I can tell you whether  $J(w)$  is 3-Calabi-Yau. The classification depends on how  $w$  transforms under the action of the symmetric group  $S_3$  and on the nature of the cubic divisor that is the vanishing locus in the projective plane of the image of  $w$  in the symmetric algebra  $SV$ . (Received August 30, 2014)