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Alfred G Noel* (alfred.noel@umb.edu), 100 Morrissey Blvd, Boston, MA 02125, and **Steven Glenn Jackson, Todor Milev** and **Thomas Folz-Donahue**. *Algorithms for Computing Tau Signatures*.

Let \mathfrak{g} be a complex reductive Lie algebra with Weyl group W . We describe algorithms by which one can read off the complex nilpotent orbit associated with a cell representation of W . Given any representation V of W we define the *sign signature* of V $signSignatureV$ to be the set of all parabolic subgroups $P \subseteq W$ (relative to a fixed simple basis) such that $V|_P$ contains a copy of the sign representation of P . The sign signature depends only on the conjugacy class of P .

For W of classical type, we show that the irreducible representations of W are determined by their sign signatures, and we give a simple algorithm by which one can use the sign signature to find the partition or partition-pair indexing a given irreducible representation. The parametrization of irreducible representations using sign signatures fails for the exceptional Weyl groups. But we show that the extended sign signature determines uniquely the irreducible representations of W in general.

Finally, we obtain a simple method which computes the nilpotent orbit associated with the cell representation of W directly from its τ -invariants. These algorithms are being implemented in the Atlas of Lie Groups and Representations international project. (Received September 12, 2018)