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**Nathan M Dunfield\*** (nmd@illinois.edu) and **Jacob Rasmussen**. *An  $SL(2, \mathbb{R})$  Casson-Lin invariant and applications.*

When  $M$  is the exterior of a knot  $K$  in the 3-sphere, Lin showed that the signature of  $K$  can be viewed as a Casson-style signed count of the  $SU(2)$  representations of  $\pi_1(M)$  where the meridian has trace 0. This was later generalized to the fact that signature function of  $K$  on the unit circle counts  $SU(2)$  representations as a function of the trace of the meridian. I will define the  $SL(2, \mathbb{R})$  analog of these Casson-Lin invariants, and explain how it interacts with the original  $SU(2)$  version via a new kind of smooth resolution of the real points of certain  $SL(2, \mathbb{C})$ -character varieties in which both kinds of representations live. I will use the new invariant to study left-orderability of Dehn fillings on  $M$  using the translation extension locus I introduced with Marc Culler, and also give a new proof of a recent theorem of Gordon's on parabolic  $SL(2, \mathbb{R})$  representations of two-bridge knot groups. This is joint work with Jake Rasmussen. (Received November 02, 2018)