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**Elise A. Weir\*** (eweir@utk.edu). *Zariski dense surface subgroups in  $SL(5, Z)$  and the restricted Hitchin component for triangle groups.*

A hyperbolic triangle group  $T(p, q, r)$  is the group of orientation-preserving isometries of a tiling of the hyperbolic plane  $H^2$  by geodesic triangles with angles  $\pi/p$ ,  $\pi/q$ , and  $\pi/r$ . The quotient of  $H^2$  by this group action produces a spherical orbifold with cone points of orders  $p$ ,  $q$ , and  $r$ . Our setting consists of representations of triangle groups in the Hitchin component, a component of the representation variety where representations are always discrete and faithful. The Hitchin component serves as a higher-dimensional generalization of Teichmüller space, and relates to deformation spaces of hyperbolic structures on orbifolds.

In particular, we produce a formula for the dimension of the Hitchin component for representations of each hyperbolic triangle group  $T(p, q, r)$  to either  $Sp(2m)$  or  $SO(m, m+1)$ , and for any  $m \geq 1$ . To better understand the benefit of considering a symplectic or special orthogonal codomain (as opposed to special linear), we will discuss connections to the pursuit of finding infinite families of representations  $\tau_k : T(3, 3, 4) \rightarrow SL(5, Z)$  with images that are Zariski dense in  $SL(5, R)$  and which can be used to generate infinitely many pairwise non-conjugate surface subgroups in  $SL(5, Z)$ . (Received September 24, 2018)