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**Patrick Allen\*** (pballen@illinois.edu). *Automorphic points in Mazur's deformation space.*

Mazur's deformation theory of Galois representations has played a central role in the study of Langlands reciprocity for number fields. For a fixed mod  $p$  automorphic Galois representation,  $p$ -adic automorphic Galois representations lifting it determine points in Mazur's deformation space. In favourable situations, we expect these automorphic points to be Zariski dense. In the case of modular forms and under some technical conditions, Böckle showed that every component of deformation space contains a smooth modular point, which then implies their Zariski density when coupled with the infinite fern of Gouvêa and Mazur. I will discuss an improvement and generalization of Böckle's result. When combined with work of Chenevier, this implies new results on the Zariski density of automorphic points in deformation space. (Received August 11, 2015)