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**Patrick Allen\*** (pballen@illinois) and **James Newton**. *Monodromy for some rank two Galois representations over CM fields.*

In the automorphic-to-Galois direction of Langlands reciprocity, one aims to construct a Galois representation whose Frobenius eigenvalues are determined by the Satake parameters of the automorphic representation at all but finitely many places. For cohomological cuspidal automorphic representations of  $GL_n$  over CM fields, these Galois representations were constructed by Harris–Lan–Taylor–Thorne. It is natural to ask what happens at the ramified places, and conjecturally the answer is given by the local Langlands correspondence. Up to semisimplification, this was proved by Varma for the Galois representations constructed by Harris–Lan–Taylor–Thorne. These methods, however, do not prove the existence of the monodromy operator in cases it should exist, because they rely on  $p$ -adic interpolation, which can only keep track of characteristic polynomials. Using recently developed automorphy lifting theorems and a strategy of Luu, we prove the existence of the monodromy operators for some rank two Galois representations over CM fields. This is joint work with James Newton. (Received September 25, 2018)