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Renee Bell, Jeremy Booher* (jeremy.booher@canterbury.ac.nz), **William Y Chen** and **Yuan Liu**. *Tamely Ramified 3-Pointed Covers with Alternating and Symmetric Monodromy*.

Let k be an algebraically closed field of characteristic p , and U be the projective line over k with three points removed. We investigate which groups G can arise as the monodromy group of tamely ramified covers (étale covers of U with *tame ramification* at the three removed points). This provides new information about the tame fundamental group of U . In particular, we show that for fixed p , there are families of tamely ramified covers with monodromy the symmetric group S_n for infinitely many n , and similarly for alternating groups. The standard approach is to reduce covers from characteristic zero, imposing restrictions on the monodromy group in order to apply criteria of Raynaud and Obus to guarantee good reduction. We overcome this restriction to produce symmetric and alternating monodromy groups by constructing our covers using the moduli spaces of elliptic curves with $\mathrm{PSL}_2(\mathbf{F}_\ell)$ -structure, which has a natural map to \mathbb{P}^1 and where the primes of good reduction are readily apparent. We use work of Bourgain, Gamburd, and Sarnak, and adapt work of Meiri and Puder, to understand the monodromy action for this moduli space; reducing an appropriate component modulo p gives the desired tamely ramified covers. (Received September 01, 2019)