Computing L-series of hyperelliptic curves in moderate genus

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I will report on a joint project with Drew Sutherland to implement an algorithm for computing the local factors of the zeta function of a hyperelliptic curve over Q for all $p < N$ in average polynomial time. In this new algorithm, the dependence of the complexity on the genus is essentially g^4, improving on the previously published g^8 bound. We expect it to be be practical for curves of moderate genus.