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David J Pinchbeck* (dpinchbe@sjcme.edu), 278 White's Bridge Rd, Standish, ME 04084.

Schwarzian and Fuchsian equations on a Riemann surface.

Let Ω be a Fuchsian connection on a rank-two holomorphic bundle on a punctured Riemann surface C , with associated matrix equation $F^{-1}\partial_z F = \Omega$. Let S be a projective connection on C with double poles, associated to the scalar equation $y'' + (1/2)S(z)y = 0$. We describe a monodromy-preserving “Schwarzian operator” $\mathbf{S} : \Omega \mapsto S$; this mapping is bijective when restricted to spaces of connections with prescribed signatures at the punctures. We illustrate with an example in low genus. (Received September 13, 2012)