Schwarzian and Fuchsian equations on a Riemann surface.

Let $\Omega$ 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 $y'' + \frac{1}{2}S(z)y = 0$. We describe a monodromy-preserving “Schwarzian operator” $S : \Omega \mapsto S$; 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)