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Riemann-Hilbert families of Schwarzian equations on the punctured torus.

Given a representation of a monodromy group on a punctured Riemann surface, we define a "Riemann-Hilbert" correspondence with a matrix equation $F^{-1}\partial F = \Omega$ for a Fuchsian connection Ω associated to a vector bundle derived from the monodromy. We then associate to each such Ω a projective connection S on the surface so that the Fuchsian equation and the Schwarzian equation $y'' + \frac{1}{2}Sy = 0$ have the same monodromy. This results in a solution to the Riemann-Hilbert problem for Schwarzian equations. In this talk we apply the method to the once-punctured torus and analyze the resulting families of Schwarzians. (Received September 21, 2010)