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Michel L. Lapidus* (lapidus@math.ucr.edu), University of California, Department of Mathematics, Riverside, CA 92521-0135. *Feynman Integrals with Highly Singular Potentials*. Preliminary report.

We shall first review various approaches used to deal with Schrodinger equations with highly singular potentials (or interactions), with emphasis on the analytic-in-mass Feynman integral. [Much of this material can be found in Sections 13.5 and 13.6 of the book by Gerald W. Johnson and the author, entitled "The Feynman Integral and Feynman's Operational Calculus" (Oxford Univ. Press, 2000).]

We shall then briefly discuss the possible relevance of those approaches (combined with the renormalization group flow approach) to the study of the modular flows of zeta functions and of zeros introduced in the author's forthcoming book, entitled "In Search of the Riemann Zeros: Strings, fractal membranes and noncommutative spacetimes" (Amer. Math. Soc., Dec. 2007, in press), in connection with a new geometric and dynamical interpretation of the Riemann hypothesis. (See, especially, Sections 5.1-5.3 of that book.) (Received September 08, 2007)