

Sessão: Física Matemática

A Riemann-Hilbert approach to Einstein field equations

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The field equations of gravitational theories in 4 dimensions are non-linear PDE's that are difficult to solve in general. By restricting to a subspace of solutions that only depend on two space-time coordinates, alternative approaches to solving those equations become available. We present here a Riemann-Hilbert approach, looking at the dimensionally reduced field equations as an integrable system associated to a certain Lax pair, whose solutions can be obtained by factorizing a so called monodromy matrix. This approach allows for the explicit construction of solutions to the non-linear gravitational field equations using simple complex analytic methods.