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Regularity and variational problems for Airy processes

The Airy processes are stochastic processes that have come out of both random growth models and random matrix theory. They are defined in terms of their finite dimensional distributions which are given by large Fredholm determinants. However, this description is not so useful for proving local path properties or for solving variational problems which arise in a natural way. We give an alternate description and show how it can be used to obtain such information.