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Arctic curves of the four-vertex model

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We consider the four-vertex model with a particular choice of fixed boundary conditions, closely related to scalar products of off-shell Bethe states. In the scaling limit, the model exhibits the limit shape phenomenon, with the emergence of an arctic curve separating a central disordered region from six frozen 'corners' of ferroelectric or anti-ferroelectric type. We determine the analytic expression of the interface by means of the EFP method. This is based on the exact evaluation of suitable correlation functions, discriminating spatial transition from order to disorder, in terms of the partition function of some discrete log-gas associated to Hahn polynomials. As a by-product, we also deduce that the arctic curve's fluctuations are governed by the Tracy-Widom distribution.

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