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# Entanglement in the generalized $XY$ model and block Toeplitz determinant

**Man Yue Mo**

Department of Mathematics  
Bristol University  
University Walk  
Bristol, BS8 1TW  
UK

`mo@maths.ox.ac.uk`

## **Abstract**

In this **joint work with Its and Mezzadri**, we have studied the asymptotics of the entropy a class of spinchain that generalizes the  $XY$  spinchains. The entropy of these spinchains are expressible in terms of a block Toeplitz determinant whose asymptotics can be computed by using the Riemann–Hilbert method. We were able to express the entropy in terms of hyperelliptic theta functions and have studied the limiting entropy when a phase transition occurs. The results generalizes the previous work by Its, Jin and Korepin.