On the Spurious Side of Rational Interpolation

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Rational and Padé approximation has a long history and many applications. We review some of that history and some of the convergence theory. One of the curious features is the appearance of spurious poles - poles that do not reflect the analytic properties of the underlying function. We review some of the features of this, and its relations to spurious zeros, and extra interpolation points. We show that when there are no extra interpolation points, there are no spurious poles - at least for entire functions and for a subsequence of approximants. We also review the status of the related Baker-Gammel-Wills Conjecture for entire functions.