

1077-65-2441 **Lloyd N. Trefethen*** (trefethen@maths.ox.ac.uk), Oxford Mathematical Institute, 28 St. Giles, Oxford, OX13LB, England. *Robust rational interpolation and least-squares.*

Rational approximations are notoriously fragile. In different contexts they may fail to exist, fail to be unique, or depend discontinuously on the data. Some approximations show forests of seemingly meaningless pole-zero pairs or "Froissart doublets", and when these artifacts should not be there in theory, they often appear in practice because of rounding errors on the computer. Here, in joint work with Pedro Gonnet and Ricardo Pachon, we present a method for getting around most of these problems using the singular value decomposition. (Received September 22, 2011)