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Christopher J Hillar* (chillar@math.tamu.edu), Texas A&M University, Dept. Mathematics,
College Station, TX 77843. *Advances on the Bessis-Moussa-Villani trace conjecture.*

A long-standing conjecture asserts that the polynomial

$$p(t) = \text{tr}[(A + tB)^m]$$

has nonnegative coefficients whenever m is a positive integer and A and B are any two $n \times n$ positive semidefinite Hermitian matrices. The conjecture arises from a question raised by Bessis, Moussa, and Villani (1975) in connection with a problem in theoretical physics. Their conjecture, as shown recently by Lieb and Seiringer, is equivalent to the trace positivity statement above. We discuss recent advances on this conjecture and outline a general program that has had some recent success. (Received September 12, 2007)