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We characterize those codimension-two configurations  $A$  whose associated  $A$ -hypergeometric system admits, for some integral homogeneity, a rational solution which is stable, i.e. not annihilated by any partial derivative. We prove that as conjectured in: E. Cattani, A. Dickenstein, and B. Sturmfels, *Rational Hypergeometric Functions*, Compositio Math., 2001, such an  $A$  must be a Cayley essential configuration. The proof uses in an essential manner the classification of algebraic univariate hypergeometric functions due to F. Beukers and G. Heckman. *Monodromy for the hypergeometric function  ${}_nF_{n-1}$* , Invent. Math., 1989. (Received February 10, 2008)