Wen-Xiu Ma and Junyi Tu* (junyi@mail.usf.edu), Tampa, FL 33613. Hirota bilinear equations possessing linear superposition principles of exponential waves. Preliminary report.

We explore when Hirota bilinear equations possess the linear superposition principle of exponential traveling waves. In particular, we show that multivariate polynomials whose zeros form a vector space generate such Hirota bilinear equations. We formulate the required multivariate polynomials by using multivariate polynomials which have one and only one zero. Applying an algorithm involving weights, a few illustrative examples are given. (Received December 24, 2011)