Beta-hypergeometric probability distribution on symmetric matrices

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We first give some properties based on independence relations between matrix beta random variables of the first kind and of the second kind which are satisfied under a condition on the parameters of the distributions. We then use results on Jordan algebras and their symmetric cones to introduce a class of matrix-variate beta-hypergeometric distributions containing the beta ones as a particular case. We show that with these distributions, the properties established for the beta distributions are satisfied without any condition on the parameters. The results involve many remarkable properties of the zonal polynomials with matrix arguments and the use of random matrix continued fractions.