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Tonghui Wang* (twang@nmsu.edu), Department of Mathematical Sciences, Las Cruces, NM 88003, and **Ziwei Ma**. *Decomposition of Quadratic Forms under Skew-normal Setting*.

The normality is a fundamental assumption in many natural and social science theories such as economics, finance, population genetics, just to name a few. However, the real data, which exhibit asymmetry, are very common. The more flexible model is desired and necessary to archive robust and reliable analysis. The family of skew-normal distributions, which is an extension of the normal distributions and is enable to model skewed observations. In this talk, (i) the properties of skew normal family in both univariate and multivariate forms are discussed; (ii) the noncentral skew chi-square distribution is introduced; (iii) the de-compositions of noncentral skew chi-square distribution and of noncentral skew Wishart distributions are obtained. Examples are given for the illustration of the main results. (Received August 06, 2020)