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Abbas M Alhakim* (aa145@aub.edu.lb), American University of Beirut, Bliss Street, P.O.Box: 11-0236, Beirut, Lebanon. *Decomposing the Chi-Square Goodness-of-Fit Statistic by Hadamard-Like Matrices*. Preliminary report.

We present a symbolic decomposition of the Pearson chi-square statistic with unequal cell probabilities, by presenting Hadamard-type matrices whose columns are the eigenvectors of the variance-covariance matrix of the cell counts, with respect to an inner product induced by the cell probabilities. When the latter are equal, this decomposition reduces to a well-known decomposition by regular $\{-1, 1\}$ Hadamard matrices. We also present some natural constructions of eigenvectors for some non-pure powers of 2, for both equal and unequal cell probabilities. (Received September 16, 2014)