1086-62-1752   **Mehdi Razzaghi*** (`mrazzagh@bloomu.edu`), Department of Mathematics, Bloomsburg University, Bloomsburg, PA 17815. *Approximating the Distribution of Fisher's Combined p-Values from Multiple Experiments with Application.* Preliminary report.

In biological experiments, genetics, epidemiology and many other fields, it is often necessary to test several hypotheses. In these experiments, the p-values from all the tests need to be combined to derive an observed significance level for the entire experiment. Fisher was the first person to consider this question as early as 1925. Fisher showed that since the p-value from each test is a uniform random variable over the interval (0,1), if the p-values from all the tests are assumed to be independent, then the distribution of the sum of the logarithms of the square of the reciprocals of the p-values is a Chi square distribution. This property may work well in certain situations. However, in many experiments, the assumption of independence of p-values can lead to erroneous and invalid results. There have been several attempts to generalize the Fisher's results to situations when p-values are dependent. To date, there is no universally accepted method for combining dependent p-values. Here, we derive an approximation to the moment generation function of the Fisher's statistic when p-values are dependent. The moments of the joint distribution of the product of p-values is expressed as a linear model whose parameters are estimated by using a sequence of fractional moments. (Received September 24, 2012)