Discrepancy in Experimental Designs

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Summary. Various discrepancies, which are measures of uniformity of a set of points in a domain, have played important roles in quasi-Monte Carlo methods. For instance, the star discrepancy (also known as Kolmogorov-Smirnov statistic) has been used in both high dimensional integral as well as of goodness-of-fit tests. Discrepancy provides an essential geometrical criterion to measure closeness of two distributions. However, the traditional star L_p-discrepancy has some weaknesses. Therefore, in a series of his papers Hickernell proposed several attractive new discrepancies. Now, these discrepancies have played important roles in the uniform, fractional factorial, and supersaturated designs. In this talk I shall review the usefulness of these discrepancies in experimental designs.