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Joseph Kung* (kung@unt.edu), Department of Mathematics, University of North Texas, Denton, TX 76203. *Parcels defined by congruence conditions and evaluations of the Tutte polynomial*. Preliminary report.

Let $M(G)$ be a matroid defined by linear dependence on the column vectors of a matrix G over the finite field $\text{GF}(q)$. A flow is a vector in the row space of G . A parcel is a subset of pairs (f, g) of functions satisfying a coboundary condition, that the difference $f - g$ is a flow and a congruence condition, that the size of the supports of f and g satisfy some congruence condition. We will present several results of the form: a linear combination of sizes of parcels, with coefficients roots of unity, equals an evaluation of the Tutte polynomial of $M(G)$ at a real or complex point $(\lambda - 1, x - 1)$ on the hyperbola $(\lambda - 1)(x - 1) = q$. (Received August 19, 2010)