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*On the Hamilton-Waterloo Problem with odd orders*

Given non-negative integers  $v, m, n, \alpha, \beta$ , the Hamilton-Waterloo problem asks for a factorization of the complete graph  $K_v$  into  $\alpha$   $C_m$ -factors and  $\beta$   $C_n$ -factors. We may assume without loss of generality that  $n \geq m$ . Clearly,  $n, m \geq 3$  odd,  $m \mid v$ ,  $n \mid v$  and  $\alpha + \beta = (v - 1)/2$  are necessary conditions. In this talk we present results that show that these necessary conditions are sufficient when  $v$  is a multiple of  $nm$ , except possibly when  $\beta = 1$  or  $3$ , or  $v = mn$  and  $\alpha < \frac{n-1}{2}$ .

This is joint work with Andrea Burgess and Tommaso Traetta. I will discuss some of the history of the problem and present the main result, Tommaso Traetta will be presenting some further results on which this one rests in his talk.