

# On the Hamilton-Waterloo Problem with Two Cycle Sizes

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(joint work with Sibel Özkan)

The Hamilton-Waterloo problem with uniform cycle sizes, denoted by  $(n, m)$ -HWP( $v; r, s$ ), asks for a resolvable cycle decomposition of the complete graph  $K_v$  (for odd  $v$ ) or  $K_v$  minus a 1-factor (for even  $v$ ) where  $r$  parallel classes consist of cycles of length  $n$  and  $s$  parallel classes consist of cycles of length  $m$  with  $r + s = \lfloor \frac{v-1}{2} \rfloor$ . In this talk, first, I will present the results on the Hamilton-Waterloo problem with 4-cycle and  $m$ -cycle factors. Then I will determine a complete solution for even  $m$  as well as all possible solutions with a few possible exceptions for odd  $m$  to the problem for the case of  $m$ -cycles and  $4m$ -cycles.

MSC2000: 05C70, 05C51.

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