

## Abstract

Let  $P$  be a finite poset and  $H(P)$  be the hypergraph whose vertices are the points of  $P$  and whose edges are the maximal intervals in  $P$ . We study the domatic number  $d(G(P))$  and the total domatic number  $d_t(G(P))$  of the 2-section graph  $G(P)$  of  $H(P)$ . For the subset  $P_{l,u}$  of  $P$  induced by consecutive levels  $\cup_{i=l}^u N_i$  of  $P$ , we give exact values of  $d(G(P_{l,u}))$  when  $P$  is the chain product  $C_{n_1} \times C_{n_2}$ . According to the values of  $l, u, n_1, n_2$ , the maximal domatic partition is exhibited. Moreover, we give some exact values or lower bounds for  $d(G(P * Q))$  and  $d_t(G(P_{l,u}))$ , when  $*$  is the direct sum, the linear sum or the Cartesian product. Finally we show that the domatic number and the total domatic number problems in this class of graphs are NP-complete