1054-05-55 **Steven Butler*** (`butler@math.ucla.edu`), UCLA Mathematics Department, Box 951555, Los Angeles, CA 90095-1555, and **Kevin Costello** (`kcostell@math.gatech.edu`) and **Ronald Graham** (`graham@ucsd.edu`). *Finding patterns avoiding many monochromatic constellations.*

Given fixed $0 = q_0 < q_1 < q_2 < \cdots < q_k = 1$ a constellation in $[n]$ is a scaled translated realization of the q_i with all elements in $[n]$, i.e.,

$$p, p + q_1 d, p + q_2 d, \ldots, p + q_{k-1} d, p + d.$$

We consider the problem of minimizing the number of monochromatic constellations in a two coloring of $[n]$. We show how given a coloring based on a block pattern how to find the number of monochromatic solutions to a lower order term, and also how experimentally we might find an optimal block pattern. We also show for the case $k = 2$ that there is always a block pattern that beats random coloring. (Received August 31, 2009)