Year: 2016 | **Vol.: 89** | **Fasc.: 3**

Title: A minimal set of cancellation violating sequences for finite two-dimensional non-additive measurement

Author(s): Lin Li and Che Tat Ng

A weak order $\precsim$ on a finite two-dimensional Cartesian product set $X = X_1 \times X_2$ has an additive real-valued representation if and only if it satisfies a sequence of cancellation conditions $C(2), C(3), \ldots$. Given fixed cardinalities m and n for X_1 and X_2, there is a largest K, denoted by $f(m,n)$, such that some $\precsim$ on X satisfies $C(2)$ to $C(K-1)$ but violates $C(K)$. In 2001, Fishburn presented several open problems, including the exact values of $f(m,n)$ for some small (m,n). Recently, by giving a minimal chain of cancellation violating sequences adequate for the detection of all non-additively representable weak orders for $(m,n) = (3,3)$, $(3,4)$ and $(3,5)$, Ng shows that $f(3,5) = 4$. This article is a continuation of the above work for $(m,n) = (3,6)$.

Address:
Lin Li
Department of Mathematics, Physics
and Information Engineering
Jiaxing University
Jiaxing, Zhejiang 314001
P. R. China

Address:
Che Tat Ng
Pure Mathematics
University of Waterloo
200 University Ave West
Waterloo, ON
Canada N2L 3G1