1041-46-118 **Vladimir G Troitsky*** (vtroitsky@math.ualberta.ca), Department of Mathematical and Statistical Sc, University of Alberta, Edmonton, Alberta T6G 2G1, Canada. *Zigzag vectors in linear subspaces of* $\mathbb{R}^n$.

A vector $(x_i)_{i=1}^n$ in $\mathbb{R}^n$ is called a *zigzag* of order $k \leq n$ if it has a subsequence of alternating plus and minus ones of length k. We prove that for every $k = 1, \ldots, n$, every k-dimensional subspace of $\mathbb{R}^n$ contains a zigzag of order k. We present a proof of this fact based on combinatorial properties of the facial structure of convex simplicial centrally symmetric polytopes. We also present some applications of this fact to operator theory. This is a joint work with I.Chalendar, E.Fricain, A.Popov, and D.Timotin. (Received August 06, 2008)