1135-05-2308 **Carlos A Alfaro** (alfaromontufar@gmail.com), , Mexico, **Walter Carballosa*** (waltercarb@gmail.com), Miami, FL, **Silvia Fernandez-Merchant** (silvia.fernandez@csun.edu), Northridge, CA, **Alain Olavarrieta** (alainolavarrieta@gmail.com), Austin, TX , and **Yakov Sapozhnikov** (yakov.sapozhnikov.473@my.csun.edu), Northridge, CA. *On the rectilinear crossing numbers of complete 4-partite graphs.*

In this work we study the rectilinear crossing number of complete 4-partite graphs. We prove that the rectilinear crossing number of complete 4-partite graph $K_{2,2,2,2}$ is equal to 8, which shows that topological crossing number of the complete 4-partite K_{n_1,n_2,n_3,n_4} is not always equal to its rectilinear crossing number since $cn(K_{2,2,2,2}) = 6$. Besides, using an optimal rectilinear drawing of $K_{2,2,2,2}$, we give a general rectilinear construction of K_{n_1,n_2,n_3,n_4} that provides an upper bound of the rectilinear crossing number of complete 4-partite graphs. This upper bound improves some previous known upper bounds. For instance, our general construction improves the upper bound for $cr(K_{2,2,2,3})$ from 15 to 12, settling $cr(K_{2,2,2,3}) = \overline{cr}(K_{2,2,2,3}) = 12$. This upper bound stablishes an inequality about the crossing number of complete 4-partite graphs similar to the Zarankiewicz's conjecture. This inequality provides a beneficial result for a large class of complete 4-partite graphs respect to an extended kind of the Zarankiewicz's conjecture for complete 4-partite graphs, like the well-known one for complete tripartite graphs. (Received September 25, 2017)