On zero-sum flow numbers of Hanoi graphs

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As an analogous concept of nowhere-zero flows for directed and bi-directed graphs, we consider zero-sum flows for undirected graphs. For an undirected graph G, a zero-sum k-flow is an assignment of non-zero integers whose absolute values are less than k to the edges, such that the sum of the values of all edges incident with each vertex is zero. Furthermore we generalize the notion via calculating the zero-sum flow number of a graph G, namely, the least integer k for which G may admit a zero-sum k-flow. The Zero-Sum 6-Flow Conjecture was raised by Akbari et al. in 2009: If a graph admits a zero-sum flow, it admits a zero-sum 6-flow. Note that it was showed that if Zero-Sum 6-Flow Conjecture is true for $(2, 3)$-graphs (in which every vertex is of degree 2 or 3), then it is true for any graph. Henceforth the study can be reduced to $(2, 3)$-graphs. In this talk we will survey the progress of zero-sum flows and zero-sum flow numbers for graphs. Recent results regarding the Zero-Sum 6-Flow Conjecture over certain classes of $(2, 3)$-graphs, particularly the calculation of Hanoi graphs, will be presented and open problems will be posted.