

# Mathematical aspects of Balaban index

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Balaban index is defined as

$$J(G) = \frac{m}{m - n + 2} \sum \frac{1}{\sqrt{w(u) \cdot w(v)}},$$

where the sum is taken over all edges of a connected graph  $G$ ,  $n$  and  $m$  are the cardinalities of the vertex and the edge set of  $G$ , respectively, and  $w(u)$  (resp.  $w(v)$ ) denotes the sum of distances from  $u$  (resp.  $v$ ) to all the other vertices of  $G$ .

In the talk, I will present the following results regarding this index:

- an upper bound for the Balaban index of regular graphs, and also an improved bound for fullerene graphs;
- graphs of prescribed order with minimum Balaban index;
- accumulation points of Balaban index;
- Balaban index of nanotubes, etc.