CIDMA CENTRO DE I&D EM MATEMÁTICA E APLICAÇÕES
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Departamento de Matemática

Seminário OGTC

Optimization, Graph Theory and Combinatorics

20 de novembro de 2024 (14h00)
(Sala Sousa Pinto)

On Randić Energy of Caterpillar Trees. Old and new results

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A caterpillar graph $T(p_1, \ldots, p_r)$ of order $n = r + \sum_{i=1}^{r} p_i$, $r \geq 2$, is a tree such that removing all its pendent vertices gives rise to a path of order r. A motivation for studying caterpillar trees is due to the one-to-one correspondence between them and those of the hexagons of the benzenoid system in Chemistry. In this talk, we will show some known results about the Randić energy of caterpillar trees $T(p_1, \cdots p_r)$, where $r \geq 2$, established in [2]. Also, we will show the most recent results on the problem of characterizing caterpillar trees with extreme Randić energy. In particular, we establish an explicit expression to calculate the Randić energy of caterpillar trees $T(p_1, p_2, p_3)$ and for $r \geq 4$, we present an improved and tight lower bounds for the Randić energy of caterpillar trees $T(p_1, p_2, \ldots, p_r)$, where $p_i \in \mathbb{N}$, $i = 1, \ldots, r$. Moreover, we show the scope of our main results by means of an algorithmic procedure. Several numerical examples are presented and some important conclusions are obtained. The results presented in this talk have recently been submitted in [1].

Joint work with:
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Referências

[1] R. C. Díaz and P. Carvalho *New results on the Randić Energy of Caterpillar Trees*, 2024.

[2] D. M. Cardoso, P. Carvalho, R. C. Díaz, P. Rama *On the Randić energy of caterpillar graphs*, MATCH Communications in Mathematical and in Computer Chemistry **87** (2022) 729–744 **ISSN:** 0340–6253. https://doi.org/10.46793/match.87-3.729C