FIRST ZAGREB MATRIX AND ENERGY OF A T_2 HYPERGRAPH

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Abstract: Let H be a T_2 hypergraph of order $n \geq 4$. The first Zagreb matrix of H, denoted by $Z(H)$ is defined as the square matrix of order n, whose $(i,j)^{th}$ entry is $d_i + d_j$ if x_i and x_j are adjacent and zero for other cases. The first Zagreb energy $ZE(H)$ of H is the sum of the absolute values of the eigenvalues of $Z(H)$. It is shown that, for a T_2 hypergraph $ZE(H) \leq \left\lceil \frac{\sqrt{2}(n^2+3n+1)}{\sqrt{3}} \right\rceil$.

Keywords and Phrases: T_2 hypergraph, first Zagreb matrix, first Zagreb energy.

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1. Introduction

The basic definitions and terminologies of a hypergraph are not given here and we refer to it [2] and [11]. The concept of hypergraph was introduced by Berge in 1967. In 2017, Seena V and Raji Pilakkat introduced Hausdorff hypergraph, T_0 hypergraph and T_1 hypergraph [7], [8] and [9]. Based on [8] and [9] S. Sujitha and D. Sharmila introduced T_2 hypergraph and studied Randic matrix and the corresponding energy in [10]. In 1977, Gutman [3] defind graph energy. In 2007, Nikiforov [6] extended the concept of graph energy to matrices. The first Zagreb energy was introduced by Nader Jafari Rad, Akbar Jahanbani and Ivan Gutman in [4] and later the same was studied by many authors. In this article, we study