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DEGREE ASSOCIATED EDGE RECONSTRUCTION PARAMETERS OF STRONG DOUBLE BROOMS

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ABSTRACT

An edge deleted unlabeled subgraph of a graph G is an *ecard*. A *da-ecard* specifies the degree of the deleted edge along with the ecard. The *degree associated edge reconstruction number* of a graph G, $dern(G)$, is the size of the smallest collection of da-ecards of G that uniquely determines G. The *adversary degree associated edge reconstruction number* of a graph G, $adern(G)$, is the minimum number k such that every collection of k da-ecards of G uniquely determines G. A *strong double broom* is the graph on at least 5 vertices obtained from a union of (at least two) internally vertex disjoint paths with same ends u and v by appending leaves at u and v. In particular, $B(n, n, mP_k)$ is the strong double broom with n leaves at both the ends u and v and with m internally vertex disjoint paths of order k joining u and v. We show that *dern* of strong double brooms is 1 or 2. We also determine $adern(B(n, n, mP_k))$. It is 3 in most of the cases and 1 or 2 for all the remaining cases, except $adern(B(1, 1, 2P_k)) = 5$ for $k \geq 4$.

Keywords: isomorphism, Ulam's conjecture, edge reconstruction number

1. Introduction

All graphs considered in this paper are finite, simple and undirected. We shall mostly follow the graph theoretic terminology of [10]. A *vertex-deleted subgraph* or *card* $G-v$ of a graph (digraph) G is the unlabeled graph (digraph) obtained from G by deleting the vertex v and all edges (arcs) incident with v. The *deck* of a graph (digraph) G is its collection of cards. Following the formulation in [2], a graph (digraph) G is *reconstructible* if it can be uniquely determined from its deck. The well-known Reconstruction Conjecture (RC) due Kelly [12] and Ulam [21] asserts that every graph with at least three vertices is reconstructible. The conjecture has been proved for many special classes, and many properties of G may be deduced from its deck. Nevertheless, the full conjecture remains open. Surveys of results on the RC and related problems include [3]. Harary and Plantholt [11] defined the reconstruction number of