

**A NOTE ON CONNECTIVITY PRESERVING SPLITTING
OPERATION FOR MATROIDS REPRESENTABLE OVER $GF(p)$**

Sachin Gunjal, Prashant Malavadkar and Uday Jagdale

Department of Mathematics and Statistics,
Dr. Vishwanath Karad MIT World Peace University,
Pune - 411038, Maharashtra, INDIA

E-mail : sachin.gunjal@mitwpu.edu.in, prashant.malavadkar@mitwpu.edu.in,
uday.jagdale@mitwpu.edu.in

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Abstract: The splitting operation on a p -matroid does not necessarily preserve connectivity. It is observed that there exists a single element extension of the splitting matroid which is connected. In this paper, we define the element splitting operation on p -matroids which consist of a splitting operation followed by a single element extension. It is proved that the element splitting operation on a connected p -matroid yields a connected p -matroid. We give a sufficient condition to yield Eulerian p -matroid from Eulerian p -matroid under the element splitting operation. A sufficient condition to obtain Hamiltonian p -matroid by applying the element splitting operation on p -matroid is also provided. The characterization of the paving p -matroid which are closed under the element splitting operation, is also obtained.

Keywords and Phrases: p -matroid, element splitting operation, Eulerian matroid, connected matroid, hamiltonian matroid, elementary lift, paving matroid.

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1. Introduction

We discuss loopless and coloopless p -matroids, by a p -matroid we mean a vector matroid $M \cong M[A]$ for some matrix A of size $m \times n$ over the field $F = GF(p)$, for prime p . We denote the set of column labels of M (viz. the ground set of M) by E ,