

**A NOTE ON INTEGRABILITY CONDITIONS AND TOTALLY
GEODESIC FOLIATIONS OF DISTRIBUTIONS ON A
SEMI-SLANT LIGHTLIKE SUBMANIFOLD**

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Abstract: In the present paper, we consider a golden semi-Riemannian manifold and find its semi-slant lightlike submanifolds. We examine the integrability of the distributions D_1, D_2 and $RadTJ$ defined on semi-slant lightlike submanifolds. Further, we investigate the conditions of the foliations of the distributions when they become totally geodesic. The goal of this study is to determine the semi-slant lightlike submanifolds of a golden semi-Riemannian manifold. The distributions D_1, D_2 , and $RadTJ$ defined on semi-slant lightlike submanifolds are examined for integrability. Additionally, we look at the circumstances surrounding the distributions' foliations when they reach complete geodesic.

Keywords and Phrases: Degenerate metric, indefinite metrics, semi-slant lightlike submanifold, golden structure, golden semi-Riemannian manifold.

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1. Introduction

In [8], Duggal and Bejancu introduced the notion of lightlike submanifolds of semi-Riemannian manifolds. Since then, many geometers studied geometry of lightlike submanifolds (see [3], [9], [25], [20], [10], [21]). A submanifold J of a semi-Riemannian manifold \bar{J} is said to be a lightlike submanifold if the induced metric g on J is degenerate, i.e, $g(Q, W) = 0$ for any non-zero $Q \in \Gamma(TJ)$ and $\forall W \in \Gamma(TJ)$.