

## DEGENERATE CURVES IN PSEUDO-EUCLIDEAN SPACES OF INDEX TWO

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**Abstract.** We study degenerate curves in pseudo-Euclidean spaces of index two by introducing the Cartan reference along a degenerate curve. We obtain several different types of degenerate curves and present existence, uniqueness and congruence theorems. We also give some examples of such a curves in low dimensions.

### 1. Introduction

The aim of this paper is to find a good Frenet frame for degenerate curves in pseudo-Euclidean spaces of index two. The study of this type of curves is motivated because of the growing importance that degenerate geometry (null curves, null hypersurfaces, etc) plays in mathematical physics (see for instance [2, 7–10]). Null curves in Lorentzian (index one) space forms has been studied by several authors ([1, 3, 5]) due to its importance in General Relativity. It is well known the important role played by the anti de Sitter space, so we focus on ambient spaces of index two. A first approach to this question has been made by Duggal and Jin, [4], from a different point of view.

Here, we are going to study degenerate curves in pseudo-Euclidean spaces of index two from a mathematical viewpoint.

### 2. Preliminaries

Let  $V$  be an  $n$ -dimensional real vector space endowed with a symmetric bilinear mapping  $g: V \times V \rightarrow \mathbb{R}$ . We will say that  $g$  is degenerate on  $V$  if there exists a vector  $\xi \neq 0$  of  $V$  such that

$$g(\xi, v) = 0, \quad \text{for all } v \in V$$