On flocks of infinite quadratic cones

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Dedicated to J. A. Thas on his fiftieth birthday

Abstract

We extend some of the theory of flocks of a finite quadratic cone to the infinite case and give some examples. One of the results we prove is that a generalized quadrangle is coming from a flock if and only if all derivations of the flock are well defined.

1 Introduction

J. A. Thas has joined together the worlds of *flocks* and *generalized quadrangles* in his celebrated paper [11]. Since then a lot of people investigate this relationship and the theory has grown to unexpected heights, most of the breakthroughs being established by J. A. Thas himself (constructions, characterizations, derivations, BLT-sets, ...). In this paper dedicated to J. A. Thas, we make a modest contribution by deleting the finiteness condition. In fact, it turns out that also for the infinite case many examples exist. We will in fact mimic a lot of ideas originally from J. A. Thas, but the methods will not be completely the same. The way we want to play the game is with coordinatization (for projective planes see Hughes and Piper [5], for generalized quadrangles see Hanssens and Van Maldeghem [4]). At the same time, it offers an alternative proof for the results of Thas [11] in the finite case.

The paper is organized as follows. In section 2 we discuss the existence of flocks of quadratic cones, of generalized quadrangles related to those flocks (we will call them *flock quadrangles*), and of projective planes related to flocks (we will call them

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