Some new classes of extended generalized quadrangles of order $(q+1, q-1)$

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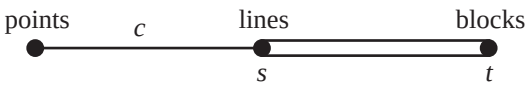
Abstract

In this paper three new classes of extended generalized quadrangles of order $(q+1, q-1)$ are constructed.

1 Introduction

An *extended generalized quadrangle* of *order* (s,t) (EGQ(s,t) for short) is a connected geometry with three types of elements, say *points, lines* and *blocks* (or *planes*) belonging to the following diagram:



This means that point-residues are generalized quadrangles of order (s,t), that block-residues are isomorphic to the complete graph K_{s+2} on $s+2$ vertices, and that line-residues are generalized digons. The parameters are assumed to be finite. An EGQ(s,t) is said to satisfy *property* (LL) if any two distinct points are incident with at most one common line.

The residue of an element x of an extended generalized quadrangle Γ will be denoted by $\mathrm{Res}(x)_\Gamma$, or $\mathrm{Res}(x)$ for short. We say that Γ is an extension of the generalized quadrangle $\mathcal{S}$ if $\mathrm{Res}(x) \cong \mathcal{S}$ for every point x of Γ. Given two extended generalized quadrangles $\widetilde{\Gamma}$ and Γ, a *covering* from $\widetilde{\Gamma}$ to Γ is an incidence-preserving

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