LINES OF FULL RANK MATRICES IN LARGE SUBSPACES

CLÉMENT DE SEGUINS PAZZIS

Abstract. Let \( n \) and \( p \) be non-negative integers with \( n \geq p \), and \( S \) be a linear subspace of the space of all \( n \) by \( p \) matrices with entries in a field \( \mathbb{K} \). A classical theorem of Flanders states that \( S \) contains a matrix with rank \( p \) whenever \( \text{codim} S < n \).

In this article, we prove the following related result: if \( \text{codim} S < n - 1 \), then, for any non-zero \( n \) by \( p \) matrix \( N \) with rank less than \( p \), there exists a line that is directed by \( N \), has a common point with \( S \) and contains only rank \( p \) matrices.


Keywords and phrases: Full rank, matrices, dimension, Flanders’s theorem.

REFERENCES