

CIRCULANT MATRIX EIGENDECOMPOSITIONS

Why

It happens that all circulant matrices have the same eigenvectors.

Definition

Recall that C is circulant then

$$C = c_0 I + c_1 S + c_2 S^2 + \dots + c_{n-1} S^{n-1}.$$

So $q \in \mathbf{R}^d$ is an eigenvector of C if and only if it is one of S.¹

¹Future editions will complete this development.

