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Constructions of multiple wavelength codes ideal auto-correlation

Several new families of multiple wavelength (2-dimensional) optical orthogonal codes (2D-OOCs) with ideal auto-correlation $\lambda_a = 0$ are presented. Such codes have at most one pulse per wavelength. Our constructions produce codes that are either optimal with respect to the Johnson bound (J-optimal), or are asymptotically optimal and maximal. The constructions are based on certain point-sets in projective or affine spaces over finite fields. The techniques may also be used to produce multiple weight codes.