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Elementary constructions of the Tits and Ree-Tits ovoids.

An ovoid of a polar space is a set of points that meets every maximal in one point. The usual constructions of the Tits ovoid of symplectic four dimensional space and of the Ree-Tits ovoid of orthogonal seven dimensional space proceed via the Suzuki groups and the Ree groups in characteristic three or via the polarity of the associated generalised polygon. An alternative elementary construction is given, which establishes results that can then be used to give elementary constructions of these groups and polarities. One motivation of seeking these proofs is wider applicability of results, with an eye to both further constructions and to characterizations.

The construction given for both ovoids is considerably simpler than that previously given by Ball and Zieve for the Tits ovoid and the slice of the Ree-Tits ovoid. (Received August 12, 2016)