

In a joint work with Laurent Gruson (the k -secant lemma and the general projection theorem), we described the singularities of the general projection of a smooth variety. I would like to discuss relations between this result (which I will recall) and the now classical classification of Severi varieties obtained by Fyodor Zak. Another interesting family of varieties appears in this context: Palatini varieties. Hopefully, Palatini varieties, that we shall define, should be classified. We don't know how to do that, but we note that the known Palatini varieties are, as Severi varieties, fundamental loci of linear congruences. We define Zak congruences as linear congruences with smooth and connected fundamental locus.

We give the list of known Zak congruences. We study their fundamental loci and present an interesting invariant, the secant index of a Zak congruence. We observe that no Zak congruences of secant index ≥ 5 is known. We close this talk with two conjectures, obviously related to the work of F. Zak.