Let K be a finitely generated field over the rationals. We consider the family of ℓ-adic representations (ℓ varies through the set of all prime numbers) of the absolute Galois group of K, attached to the ℓ-adic cohomology of a separated scheme of finite type over K.

We prove that the fields cut out from the algebraic closure of K by the kernels of the representations of the family, are linearly disjoint over a finite extension of K. This gives a positive answer to a question asked by Serre in 1991.

This will be a report on a joint work with Wojciech Gajda.