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# THE GROUP GENERATED BY AUTOMORPHISMS BELONGING TO GALOIS POINTS OF THE QUARTIC SURFACE

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ABSTRACT. We consider the group $G$ generated by automorphisms belonging to Galois points of $S_8$, which is the quartic surface with the maximal number of Galois points. We obtain several exact sequences of groups, from which we see that the order of $G$ is $2^5 3^2$. Moreover, we show that $S_8$ has a structure of $C_4$-fiber space, where $C_4$ is the quartic curve with the maximal number of Galois points.

## 1. INTRODUCTION

Let $k$ be an algebraically closed field of characteristic zero. We fix it as the ground field of our discussion. Let $V$ be a smooth curve or surface of degree $d$ in the projective plane $\mathbb{P}^2$ or in the projective three space $\mathbb{P}^3$ respectively. Let $K = k(V)$ be the rational function field of $V$. For a point $P \in V$, let $\pi_P : V \cdots \to W$ be a projection of $V$ from $P$ to a line or hyperplane $W$. The rational map $\pi_P$ induces the extension of fields $K/k(W)$. The structure of this extension does not depend on the choice of $W$, but on $P$, so that we write $K_P$ instead of $k(W)$. We have been studying the structure of this extension using geometrical methods (cf. [4], [5], [10]). The point $P$ is called a Galois point if the extension is Galois. The number of Galois points is finitely many if $d \geq 4$ (cf. [4], [10]). Hence we denote it by $\delta(V)$. An automorphism $\sigma$ of $V$ is called the one belonging to Galois point $P$ if $\sigma$ is the automorphism induced by an element of $\mathrm{Gal}(K/K_P)$. It is not only an automorphism of $V$ over $W$ but also a projective transformation of $V$ (cf. [10]).

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