

THE COMPUTATION DATA ABOUT ZARISKI PAIRS ON CUBIC SURFACES

ICHIRO SHIMADA

ABSTRACT. We explain the contents of the computation data written in the file “ZPcubic.txt”. These data are about the enumeration of Zariski pairs of line arrangements on a cubic surface.

In the text file “ZPcubic.txt”, the following data about Zariski pairs of line arrangements on a cubic surface X are presented in GAP format. These data are obtained and used in the preprint

[P] Ichiro Shimada: Zariski pairs on cubic surfaces.

In the following, the notation and terminologies in this preprint are used.

- **GramX** is the Gram matrix of $H^2(X, \mathbb{Z})$ with respect to the basis

$$h, e_1, \dots, e_6.$$

In the following, each element of $H^2(X, \mathbb{Z})$ is expressed as a vector with respect to this basis $h, e_1, \dots, e_6$.

- **antiK** is the class $[-K_X]$ of the anti-canonical line bundle $-K_X$ of X .
- **rs** is the list $r_1, \dots, r_6$ of (-2) -vectors in $V := K^\perp$, where $K := \mathbb{Z}[-K_X]$.
- **GramV** is the Gram matrix of V with respect to the basis $r_1, \dots, r_6$.
- **27lines** is the list $[\ell_1], \dots, [\ell_{27}]$ of classes of the 27 lines on X . The numbering of the 27 lines is explained in the preprint [P].
- **perms** is the list of 6 permutations on **27lines** induced by the 6 reflections $\sigma_1, \dots, \sigma_6$ of V with respect to the (-2) -vectors $r_1, \dots, r_6$.
- **WE6orbits** consists of 28 lists. For $n = 0, \dots, 27$, the $(n + 1)$ st list of **WE6orbits** is the list of orbits o of the action of $W(E_6)$ on the set $\mathcal{C}_n$ of line arrangements of size n on X . Each orbit o is expressed by the record **orb** with the following items:
 - **no** is the number of the orbit o , which is an integer in $\{1, \dots, 5486\}$.
 - **minrep** is the minimal representative $[s_1, \dots, s_n]$ of the orbit o .
 - **size** is the size $|o|$ of the orbit o .

The Zariski pairs discovered in the preprint [P] are the pair of orbits no. 17 and no. 20, and the pair of orbits no. 39 and no. 51.

MATHEMATICS PROGRAM, GRADUATE SCHOOL OF ADVANCED SCIENCE AND ENGINEERING, HIROSHIMA UNIVERSITY, 1-3-1 KAGAMIYAMA, HIGASHI-HIROSHIMA, 739-8526 JAPAN

Email address: ichiro-shimada@hiroshima-u.ac.jp

2020 *Mathematics Subject Classification.* 14N20, 14J26.

Key words and phrases. Zariski pairs, cubic surface, twenty-seven lines, Weyl group.

This work was supported by JSPS KAKENHI, Grant Number 20K20879 and 20H01798.