THE HOMOLOGY OF SINGULAR POLYGON SPACES

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Abstract. Let $M_n$ be the variety of spatial polygons $P = (a_1, a_2, \ldots, a_n)$ whose sides are vectors $a_i \in \mathbb{R}^3$ of length $|a_i| = 1$ ($1 \leq i \leq n$), up to motion in $\mathbb{R}^3$. It is known that for odd $n$, $M_n$ is a smooth manifold, while for even $n$, $M_n$ has cone-like singular points. For odd $n$, the rational homology of $M_n$ was determined by Kirwan and Klyachko [6], [9]. The purpose of this paper is to determine the rational homology of $M_n$ for even $n$. For even $n$, let $M'_n$ be the manifold obtained from $M_n$ by the resolution of the singularities. Then we also determine the integral homology of $M'_n$.

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