Kozlowski, A.; **Yamaguchi, K.**

Simplicial resolutions and spaces of algebraic maps between real projective spaces. (English)

Zbl 1276.55012
Topology Appl. 160, No. 1, 87-98 (2013).

Let $1 \leq m < n$ be positive integers and define $D_*(d;m,n) = (n-m)(\lfloor \frac{d+1}{2} \rfloor + 1) - 1$ and $D(d;m,n) = (n-m)(d+1) - 1$, for each integer $d \geq 0$. In this paper the authors improve some results from [*M. Adamaszek* and the present authors, Q. J. Math. 62, No. 4, 771–790 (2011; Zbl 1245.14060)] replacing D_* by D. More precisely, they show that $\tilde{A}_d(m,n)$ has the same homology (resp. homotopy) as the mapping space $\mathrm{Map}(\mathbb{R}P^m, \mathbb{R}P^n)$ up to dimension $D(d;m,n)$ if $m+1 = n$ (resp. $m+2 \leq n$), where $\tilde{A}_d(m,n)$ is the projectivization $A_d(m,n)(\mathbb{R})/\mathbb{R}^*$ of the space of all $(n+1)$-tuples $(f_0, \dots, f_n) \in \mathbb{R}[z_0, \dots, z_m]^{n+1}$ of homogeneous polynomials of degree d without non-trivial common real roots. Also, Theorem 1.5 provides some tools to generalize some results concerning the space of algebraic maps from real projective spaces to complex projective spaces. This is done in the authors' paper [Spaces of equivariant algebraic maps from real projective spaces into complex projective spaces; `arXiv:1109.0353` [math.AT]].

The authors use spectral sequences induced from truncated resolutions to obtain the main results.

Reviewer: Thiago de Melo (Rio Claro)

MSC:

55P10 Homotopy equivalences in algebraic topology
55P35 Loop spaces

Keywords:

simplicial resolution; homotopy equivalence; Vassiliev spectral sequence

Full Text: DOI