HIGHER WHITEHEAD PRODUCT: COMPUTATIONS AND APPLICATIONS

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Let $f_i : \Sigma A_i \to X$ for $i = 1, \ldots, n$ with $n \geq 2$. Porter [6] has generalized the Hardie's construction from [4] to construct the generalized Whitehead map $\omega_n : \Sigma^{n-1}\Lambda(\underline{A}) \to T_1\Sigma(\underline{A})$ and then defined the $n^{\mathbf{th}}$ **order generalized Whitehead product**

$$[f_1, \ldots, f_n] = \{\omega_n(f) \in [\Sigma^{n-1}\Lambda(\underline{A}), X]\}$$

for all $f : T_1\Sigma(\underline{A}) \to X$ extending $f_1 \vee \cdots \vee f_n : \Sigma A_1 \vee \cdots \vee \Sigma A_n \to X$.

The aim of the is to present:

1) Computations and properties of higher order Whitehead products. In particular, similar to the Toda bracket and those ones for triple spherical products obtained by Hardie in [3]:

Let $f_i : \Sigma A_i \to X$ be any maps for $i = 1, 2, 3$ with $[f_1, f_2, f_3] \neq \emptyset$. Then $[f_1, f_2, f_3]$ is a coset of the subgroup group
$(\Sigma^2\sigma_1)^*[\pi(\Sigma^2\Lambda^{(1)}(\underline{A}), X), f_1] + (\Sigma^2\sigma_2)^*[\pi(\Sigma^2\Lambda^{(2)}(\underline{A}), X), f_2]+$
$(\Sigma^2\sigma_3)^*[\pi(\Sigma^2\Lambda^{(3)}(\underline{A}), X), f_3] \subseteq \pi(\Sigma^2\Lambda(\underline{A}), X)$.

2) A list of applications of higher order Whitehead products.

References

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