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On classification of maps of a css complex into a css group

By

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Introduction

Let G be a reduced 0-connected css group (for the definition, see [5]) and (K, L) be a css pair. Denote by e_n the unit of G_n and by e the css subgroup of G consisting of all e_n, $n \geqq 0$. The set $\Pi(K, L; G)$ of all homotopy classes of maps $f: (K, L) \to (G, e)$ has a natural group structure. Then, we have a filtration

$$(1) \qquad \Pi(K, L; G) = D_0^1 \supseteqq D_1^1 \supseteqq D_2^1 \supseteqq \cdots,$$

by normal subgroups D_n^1 $(n \geqq 0)$ defined in § 3. On the other hand, for each $n \geqq 1$, there are sequences of subgroups:

$$H^{n-1}(K, L; \pi_n(G)) = 'P_n^n \supseteqq 'P_{n+1}^n \supseteqq \cdots \supseteqq 'P_\infty^n$$

(the reduced $(n-1)$-st cohomology group),

$$H^n(K, L; \pi_n(G)) = P_n^n \supseteqq P_{n+1}^n \supseteqq \cdots \supseteqq P_\infty^n \supseteqq 'R_1^n \supseteqq 'R_2^n \supseteqq \cdots \supseteqq 'R_n^n = 0,$$

$$H^{n+1}(K, L; \pi_n(G)) \supseteqq R_1^n \supseteqq R_2^n \supseteqq \cdots \supseteqq R_n^n = 0$$

which are defined in § 2. Our purpose of this paper is to show that, for $1 \leqq m < n$, there are homomorphisms

$$\theta_m^{n-m}: P_{n-1}^m \to H^{n+1}(K, L; \pi_n(G))/R_{m+1}^n,$$

$$'\theta_m^{n-m}: 'P_{n-1}^m \to H^n(K, L; \pi_n(G))/'R_{m+1}^n,$$

which induce isomorphisms

$$P_{n-1}^m/P_n^m \approx R_m^n/R_{m+1}^n, \quad 'P_{n-1}^m/'P_n^m \approx 'R_m^n/'R_{m+1}^n$$

(§ 2, Theorem 1) and to show that