Rational homotopy type of the component of inclusion in the nthspace of continuous mappings from Gr (k, n) to Gr(k, n + 1)

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A complex manifold can be embedded in some complex projective space CP (N), in particular, the Grassmann manifold Gr(n, k) of k dimensional subspaces in Cn can bembedded in some complex projective space CP (N).Moreover G(k, n) $\hookrightarrow$ G(k, n + 1). For k = 1, we get a one dimensional vector space which is the complex projective plane and is an embedding of CP (n)in CP (n + 1).The Grassmanian admits a CW structure and any CW structure on a space provides a filtration relative to the empty space. To a simply connected topo-logical space, Sullivan associates a commutative differential graded algebra($\wedge$V, d) which encodes the rational homotopy type of X. This is called aSullivan model of X. Given that H$*$(CP (n), Q) is the truncated polynomialalgebra $\wedge$x/(xn+1), one gets a a Sullivan model of the form () $\wedge$ (x, y), d)where |x| = 2, |y| = 2n + 1 and dx = 0, dy = xn+1. For k $\geq$ 1, one might usethe homeomorphism G(k, n) = U (n)/(U (k) × U (n − k)) to find a Sullivanmodel. In this paper, we use a Sullivan model of the inclusion Gr(k, n) $\longrightarrow$ Gr(k, n+1) to compute the rational homotopy type of the component of the inclusionin the space of mappings from Gr(k, n) to Gr(k, n + 1).

Key words: Grassmann manifold, Commutative differential graded algebra, Sullivan model