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LAGRANGIANS OF CAWLEY, SUNDERMEYER, AND DI STEFANO

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Dedicated to Prof. M.A. Pathan on his 75^{th} ***birth anniversary***

Abstract: For the Lagrangians of Di Stefano, Sundermeyer, and Cawley we exhibit the Díaz-Higuita-Montesinos expression to calculate the number of physical degrees of freedom.

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1. Introduction

In [1] was deduced the following formula to obtain the number of physical degrees of freedom (NPDF) for systems governed by singular Lagrangians:

$$NPDF = N - \frac{1}{2}(l + g + e) \tag{1}$$

where only appear quantities from the Lagrangian formalism, in fact, N, e, l, and g are the total number of generalized coordinates $q_j(t)$, effective gauge parameters [1], genuine constraints and gauge identities [2-5], respectively. This same calculation can be realized with the Hamiltonian expression [6]:

$$NPDF = N - N_1 - \frac{1}{2}N_2 \tag{2}$$

using only concepts from the Rosenfeld-Dirac-Bergmann approach [6-14], where N_1 and N_2 are the total number of first-and second-class constraints, respectively; let's