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Invariant Semisimple CR Structures on the Compact Lie Groups SU(n) and SO$(p,\mathbb{R})$, $5 \leq p \leq 7$

Let G_0 be a compact real Lie group of dimension N and denote by $\mathfrak{g}_0$ its Lie algebra. Recently J.-Y. Charbonnel and the first author [Classification des structures CR invariantes pour les groupes de Lie compacts, Journal of Lie Theory 14 (2004) 165–198] studied G_0-invariant CR structures on G_0. Such a structure is defined by the fiber of the identity element of G_0 which is a Lie subalgebra $\mathfrak{h}$ of the complexification $\mathfrak{g}$ of $\mathfrak{g}_0$, having trivial intersection with $\mathfrak{g}_0$. If the dimension of the CR structure is maximal, that is $\left[\frac{N}{2}\right]$, then Charbonnel and the first author showed that $\mathfrak{h}$ is a solvable Lie algebra. In this note, we are interested in G_0-invariant CR structures on G_0 which are defined by a semisimple Lie subalgebra and of maximal dimension. We distinguish two types of these CR structures which we shall call $CRSS$ structure of type I and of type II. In the case of the group SU(n), with $n \geq 3$, we show that there exists always a $CRSS$ structure of type I, while in the case of SO$(p,\mathbb{R})$, with $5 \leq p \leq 7$, we show that a $CRSS$ structure of type II exists. We obtain from these structures for each of these groups an almost global CR embedding into a finite-dimensional complex vector space.

Keywords: Compact Lie group, Cauchy-Riemann Structure, CR-embedding.

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