Schwarz (1975) theorem

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theorem:

Let Γ be a compact Lie group acting on V. Let $u_1, \ldots, u_s$ be a Hilbert basis for the Γ-invariant polynomials $\mathcal{P}(\Gamma)$ *(see Hilbert-Weyl theorem)*. Let $f \in \mathcal{E}(\Gamma)$. Then there exists a smooth germ $h \in \mathcal{E}_s$ *(the ring of C^∞ germs $\mathbb{R}^s \to \mathbb{R}$)* such that $f(x) = h(u_1(x), \ldots, u_s(x))$. [**?**]

proof:

The proof is shown on page 58 of [**?**].

theorem: *(as stated by Gerald W. Schwarz)*

Let G be a compact Lie group acting orthogonally on $\mathbb{R}^n$, let $\rho_1, \ldots, \rho_k$ be generators of $\mathcal{P}(\mathbb{R}^n)^G$ *(the set G-invariant polynomials on $\mathbb{R}^n$)*, and let $\rho = (\rho_1, \ldots, \rho_k) : \mathbb{R}^n \to \mathbb{R}^k$. Then $\rho * \mathcal{E}(\mathbb{R}^k) = \mathcal{E}(\mathbb{R}^n)^G$. [**?**]

proof:

The proof is shown in the following publication [**?**].

References

[GSS] Golubitsky, Martin. Stewart, Ian. Schaeffer, G. David: Singularities and Groups in Bifurcation Theory *(Volume II)*. Springer-Verlag, New York, 1988.

[SG] Schwarz, W. Gerald: Smooth Functions Invariant Under the Action of a Compact Lie Group, *Topology* Vol. 14, pp. 63-68, 1975.