

Zeitschrift: L'Enseignement Mathématique
Herausgeber: Commission Internationale de l'Enseignement Mathématique
Band: 26 (1980)
Heft: 1-2: L'ENSEIGNEMENT MATHÉMATIQUE

Artikel: SOME REMARKS ON INVARIANT WHITNEY FIELDS
Autor: Jacobsen, Leif

Bibliographie
DOI: <https://doi.org/10.5169/seals-51062>

Nutzungsbedingungen

Die ETH-Bibliothek ist die Anbieterin der digitalisierten Zeitschriften auf E-Periodica. Sie besitzt keine Urheberrechte an den Zeitschriften und ist nicht verantwortlich für deren Inhalte. Die Rechte liegen in der Regel bei den Herausgebern beziehungsweise den externen Rechteinhabern. Das Veröffentlichen von Bildern in Print- und Online-Publikationen sowie auf Social Media-Kanälen oder Webseiten ist nur mit vorheriger Genehmigung der Rechteinhaber erlaubt. [Mehr erfahren](#)

Conditions d'utilisation

L'ETH Library est le fournisseur des revues numérisées. Elle ne détient aucun droit d'auteur sur les revues et n'est pas responsable de leur contenu. En règle générale, les droits sont détenus par les éditeurs ou les détenteurs de droits externes. La reproduction d'images dans des publications imprimées ou en ligne ainsi que sur des canaux de médias sociaux ou des sites web n'est autorisée qu'avec l'accord préalable des détenteurs des droits. [En savoir plus](#)

Terms of use

The ETH Library is the provider of the digitised journals. It does not own any copyrights to the journals and is not responsible for their content. The rights usually lie with the publishers or the external rights holders. Publishing images in print and online publications, as well as on social media channels or websites, is only permitted with the prior consent of the rights holders. [Find out more](#)

Download PDF: 16.01.2026

ETH-Bibliothek Zürich, E-Periodica, <https://www.e-periodica.ch>

orthogonal action of G , the W' and W may already be chosen equivariant.

Similarly, it appears that there is a G -invariant version of the Stein extension theorem mentioned in remark 4 of [1]. This results from an invariant version of corollary 2 of [1], combined with the invariant Seeley extension theorem [7], p. 108. The X in the remark 4 is invariant if φ is (G acts on $\mathbf{R}^{n+1}$ by $g \cdot (x, y) = (g \cdot x, y)$ for $g \in G$).

An alternative approach would be via proposition 2 and the techniques of [4], which are somewhat similar.

We also wish to point out that there is a G -invariant version of the Whitney spectral theorem (see [6], ch. V or [9], ch. V):

Let $\Omega \subset \mathbf{R}^n$ be open and invariant under an orthogonal action of G , G compact Lie. Let $I \subset \mathcal{E}(\Omega)^G$ (using the action (3)) be an ideal. Then $f \in \mathcal{E}(\Omega)^G$ belongs to $\bar{I}$ if and only if for each $a \in \Omega$ there is a $g_a = g \in I$ such that $J_a(g) = J_a(f)$.

This goes via a fundamental lemma [6], p. 91, for the case $\Omega = a$ cube L . With the notations of that lemma, if L is replaced by $G \cdot L$, K by $G \cdot K$ and T_b^m by $Av_G T_b^m$, then $F \in \hat{I}$ may be assumed invariant on $G \cdot L$, whence $\|\tilde{\Phi} F - f\|_{G \cdot L}^m < \varepsilon$, ($\tilde{\Phi} = Av_G \Phi$) can be achieved. Then one proceeds. In the more general situation considered in [9], one needs [7], lemma 1.4.1 (p. 106).

The action (4) is adapted to the operators D^k . One might consider the simpler action on $J(X)$ ($X \subset \mathbf{R}^n$ G -invariant), given by $g \cdot F = (F^k \circ g^{-1})_{k \in \mathbf{N}^n}$, for $F = (F^k)_{k \in \mathbf{N}^n}$, $g \in G$. The corresponding problem of finding f with $J(f) = F$, given $F \in \mathcal{E}(X)^G$, is now wholly different as simple examples show (e.g. $G = \mathbf{Z}_2$ acting by reflexion in $0 \in \mathbf{R}$). If f exists at all, it must have strong singularities on K . As may be gleaned from [3], there are topological restrictions on K , depending on G . It would perhaps be feasible to obtain some answers if new operators are used instead of the D^k .

REFERENCES

- [1] BIERSTONE, E. and P. MILMAN. Extension and lifting of C^∞ Whitney fields. *L'Enseignement Math.* 23 (1977), 129-137.
- [2] BREDON, G. E. *Introduction to compact transformation groups*. Academic Press, 1972.
- [3] GORIN, E. A. and V. Ja. LIN. Algebraic equations with continuous coefficients and some problems of the algebraic theory of braids. *Math. USSR-Sbornik* 7 (1969), 569-596.

- [4] LOJASIEWICZ, S. Whitney fields and the Malgrange-Mather preparation theorem, *Proceedings of Liverpool singularities I (1971)*. Springer lecture notes 192.
- [5] MATHER, J. Differentiable invariants. *Topology* 16 (1977), 145-155.
- [6] POENARU, V. *Analyse différentielle*. Springer lecture notes 371.
- [7] ——— *Singularités C^∞ en présence de symétrie*. Springer lecture notes 510.
- [8] RUDIN, W. *Functional Analysis*. McGraw-Hill, 1973.
- [9] TOUGERON, J.-Cl. *Idéaux de Fonctions Différentiables*. Springer, 1972.

(Reçu le 9 août 1979)

Leif Jacobsen

Matematisk Institut
Universitetsparken 5
2100 København
Danmark