

actually a G -vector bundle since the actions of G and H on $G \times F$ commute. The projection $G \times F \rightarrow F$ extends by equivariances to a bundle equivalence

$$\begin{array}{ccc} G \times_H F & \rightarrow & E \\ \downarrow & & \downarrow \\ G/H & \approx & \Omega. \end{array}$$

Hence $\pi: E \rightarrow \Omega$ is determined by the action of H on F .

REFERENCES

1. R. Bott, *Non-degenerate critical manifolds*, Ann. of Math. (2) **60** (1954), 248–261.
2. S. Lang, *Introduction to differentiable manifolds*, Interscience, New York, 1962.
3. R. Palais, *Morse theory on Hilbert manifolds*, Topology **2** (1963), 299–340.

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SYMPLECTIC GROUPS OVER DISCRETE VALUATION RINGS

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A symplectic group over a field $\neq F_2$ or F_3 , according to a theorem of Dickson and Dieudonné (see [1]), has no normal subgroups other than its center $\{\pm 1\}$. Attempts at integral analogues of this theorem have of late been quite successful. First Klingenberg [6] showed that every normal subgroup of a symplectic group over a local ring is a congruence group (again with some exceptions). Then Bass, Lazard and Serre [2] showed that every normal subgroup of finite index in the symplectic group $Sp_{2n}(\mathbb{Z})$ over the rational integers contains a congruence subgroup if $n \geq 2$. In [5], Jehne proved local results similar to Klingenberg's, and used them to show that any normal subgroup G of the symplectic group over a suitable Dedekind ring is a congruence subgroup, if G is closed under the congruence topology.

The above three integral results all assumed that the discriminant of the alternating form is a unit. The purpose of this note is to drop this restriction and give a generalization of [6]. In order to obtain a tractable canonical form, it is necessary to assume that the local

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