Correction to `Invariant volumes of compact groups'

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ADDENDUM

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Abstract. In the previous paper by M S Marinov, the maximal torus was described wrongly, and some equalities contained a false factor. In fact, it is the maximal torus H of the universal covering group, that is an r-simplex (the Weyl alcove)

$$H:(\gamma^{(j)}\varphi)\geqslant 0, \qquad (\alpha^1\varphi)\leqslant 2\pi. \tag{16}$$

The formulae, which appeared incorrectly in Marinov (1980) are:

$$V_0(H)=(2\pi)^r(\det(\gamma^{(j)}\gamma^{(k)}))^{-1/2}\left(r!\prod_{j=1}^{r}a_j\right)^{-1} \tag{17}$$

$$V_{\mathrm{inv}}(G)=\Lambda^{n/2}(2\pi)^{p+r}n(Z)^{1/2}/[\Pi(\gamma^2/2)]^{1/2}\Pi(\alpha\rho) \tag{19}$$

$$V_0(T)/V_0(H)=n(W) \tag{22}$$

$$V_\omega(\mathrm{SO}(2r+1)_A)=2^r(2\pi)^{r(r+1)}\Big/\prod_{s=1}^{r-1}(2s+1)!$$

$$V_\omega(\mathrm{SO}(2r)_A)=2^{r-2}(2\pi)^{r^2}\Big/\prod_{s=1}^{r-1}(2s)! \tag{27}$$

$$V_\omega(\mathrm{SO}(N+1)_v)/V_\omega(\mathrm{SO}(N)_v)=V(S_N) \tag{28}$$

$$V_\xi(\mathrm{SU}(N))=2^{(N-1)/2}\pi^{(N-1)(N+2)/2}N^{1/2}\Big/\prod_{s=1}^{N-1}s! \tag{31}$$

$$V_\xi(\mathrm{SU}(N+1))/V_\xi(\mathrm{SU}(N))=V(S_{2N+1})[(N+1)/2N]^{1/2} \tag{32}$$

$$\ln V_{\mathrm{inv}}(\mathrm{SU}(N))=\tfrac{1}{2}(N^2-1)(\ln(4\pi)+\tfrac{3}{2})+\tfrac{1}{12}\ln N+\tfrac{5}{12}\ln 2-c+\mathrm{O}(N^{-1}). \tag{33}$$

The discussion of the coset spaces should be revised accordingly. Now the volumes of the unitary groups are in agreement with Bernard (1979), and $V_\xi(\mathrm{SU}(3))=\pi^5\sqrt{3}$. The results on the orthogonal groups do not contradict Gilmore (1974), provided that the vector rotation groups (not the universal covering spin groups) are in view.

I apologise for any time which may have been wasted as a result of this confusion. I am greatly indebted to Drs I Bernstein and A Vaynshteyn who prompted me to revise the work.

References

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