CORRECTIONS TO: “NONOPENNESS OF THE SET OF THOM-BOARDMAN MAPS”

Leslie Wilson
Correction to

A CYCLIC INEQUALITY AND A RELATED EIGENVALUE PROBLEM

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Professor P. Nowosad, Rio de Janeiro, has informed us that the inequality \( S(x) > N/2 \) holds for \( N = 12 \) [1]. Furthermore, our belief that the inequality also holds for odd \( N \leq 23 \) has been stated, and strongly supported by numerical evidence, in [2].


Corrections to

CHARACTERIZATION OF A CLASS OF TORSION FREE GROUPS IN TERMS OF ENDOMORPHISMS

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Corrections to

NONOPENNESS OF THE SET OF THOM-BOARDMAN MAPS

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In [3] we showed that the set of Thom-Boardman maps is open if the Morin (\( S_{1,4} \)) singularities alone occur generically, and is not
open if $S_2$ singularities occur generically. However, we neglected to consider the $S_{i,i}$ singularities, $i \geq 2$ (recall that the subscripts denote corank, not kernel rank, and that $S_{1;k}$ means $S_{1,1,\ldots,1}$ with $k$ 1's). In fact, the set of Thom-Boardman maps is not open if the $S_{1,2}$ singularities occur generically, which occurs whenever $n > p \geq 4$. Thus Theorem 1.1 of [3] should be stated: The Thom-Boardman maps form an open subset of $C(N, P)$ iff either $2p > 3n - 4$ or $p < 4$.

We will now indicate how the above claims are proved. Using Proposition 3 of [2], it is easy to calculate that the codimension of $S_{1,2}$ (which Mather denotes $\Sigma_0^{n-p+1,2}$; we assume $n > p$) is $n - p + 4$. Thus $S_{1,2}$ singularities occur generically iff $n > p \geq 4$.

The 3-jet at 0 of

$$f(x_1, \ldots, x_n) = (x_1, \ldots, x_{p-1}, x_p^2 + \cdots + x_{n-2}^2 + x_{n-1}^2x_n$$

$$+ x_1x_{n-1} + x_2x_n + x_3x_n^2)$$

lies in $S_{1,2,0} \cap \iota S_{1,2}$. That it lies in $S_{1,2,0}$ follows from Mather's algorithm for computing the Thom-Boardman type (see the last definition on p. 236 of [2]). That $j^3f$ is transverse to $S_{1,2}$ follows from the last paragraph in [2].

For each $k$, $z = j^k f(0)$ lies in the closure of $S_{1;k}$. To see this, note that the contact class of $x^2y + Q$, $Q$ a nondegenerate quadratic form in other variables, lies in the closure of the contact class of $x^2y - y^k + Q$ (consider the curve $x^2y - ty^k + Q$). By Table 3 of [1], the latter contact class lies in the closure of the contact class of $x^2 + y^{k+1} + Q$, which lies in $S_{1;k}$.

By the Transversal Extension Theorem of [3], there is a Thom-Boardman map $g$ with $j^k g(0) = z$. By Lemma 3.5 of [3], there are maps $g_m$ which converge to $g$ in the Whitney $C^\infty$ topology such that each $g_m$ has $S_{1;k}$ singularities. The codimension of $S_{1;k}$ is $n - p + k$. Thus, choosing $k > p$, $g_m$ cannot be a Thom-Boardman map.

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