Lectures on Symplectic Geometry

— Errata for the Springer 2008 printed text*—

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Many thanks to all the readers who contributed useful comments and corrections on this text, in particular, Rodrigo Casado, Alessandro Fasse, Tommaso Goldhirsch, Yael Karshon, Reto Kaufmann, Galen Liang, Rui Loja Fernandes, Lisa Ricci, Tianchen Tang, Alan Weinstein, and Manuel Wiedmer.

page 15, line 2
By Weinstein's lagrangian creed **[108]**, everything is a lagrangian manifold! not [105]

page 30, lines 5 and 4 from the bottom
is the graph of a diffeomorphism $\varphi : T^*X \to T^*X$, then φ is the symplectomorphism generated by f. In this case, $\varphi(x,\xi) = (y,\eta)$ if and only if... not f

page 31, lines 2 and 1 from the bottom
For both steps, it might be useful to recall that, given a function $\boldsymbol{h} : X \to \mathbb{R}$ and a tangent vector $v \in T_xX$, we have $d\boldsymbol{h}_x(v) = \dfrac{d}{du}\left[\boldsymbol{h}(\exp(x,v)(u))\right]_{u=0}$. not φ

page 36, lines 5-9

$$\begin{cases} \dfrac{\partial f}{\partial x} = -\dfrac{\chi(x)-\chi(y)}{|\chi(x)-\chi(y)|}\cdot\dfrac{d\chi}{ds}(x) = \cos\theta = v \\ \dfrac{\partial f}{\partial y} = -\dfrac{\chi(y)-\chi(x)}{|\chi(x)-\chi(y)|}\cdot\dfrac{d\chi}{ds}(y) = -\cos\nu = -w\,. \end{cases}$$

replace the two systems of equations by the single system above

page 36, line 15
$-|x_1 - x_2| - \ldots - |x_{N-1} - x_N| - |x_N - x_1|$ sign change

*The errata for the 2006 website text is at
https://people.math.ethz.ch/∼acannas/Papers/lsg_errata_website.pdf

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page 42, lines 9 and 13

$$\mathcal{L}_{v_t}\omega := \frac{d}{ds}\psi_{s,t}^*\omega\Big|_{s=t}$$

where $\psi_{s,t}$ is the flow of v_t, i.e., $s \mapsto \psi_{s,t_0}(p)$ is the unique maximal integral curve of v_t with value p at time $s = t_0$:

$$\tfrac{d}{ds}\psi_{s,t_0}(p)\big|_{s=t} = v_t\left(\psi_{t,t_0}(p)\right) \qquad \text{and} \qquad \psi_{t_0,t_0}(p) = p\,.$$

This is related to the previous ρ by $\rho_s = \psi_{s,0}$. If M is compact, the flow is globally defined and we have $\psi_{s,t} = \psi_{s,t_0}\circ\psi_{t_0,t}$, thus $\psi_{s,t}^{-1} = \psi_{t,s}$, and hence $\psi_{s,t} = \rho_s\circ\rho_t^{-1}$. We can use this last expression to write $\mathcal{L}_{v_t}\omega$ alternatively in terms of ρ. A good reference is the textbook by John Lee, *Introduction to Smooth Manifolds*.
the definition of Lie derivative by a time-dependent vector field v_t was wrong

page 44, Theorem 6.6
(i.e., a unique $q \in X$ minimizing $|q - \boldsymbol{p}|$) not $|q - x|$

page 44, bottom diagram

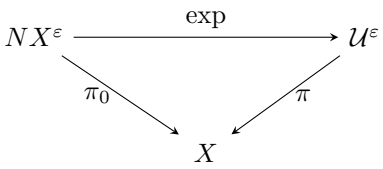

diagram was missing one arrow

page 45, Proposition 6.8
$\mu \in \boldsymbol{\Omega^{\ell-1}}(\mathcal{U})$ instead of $\Omega^{d-1}(\mathcal{U})$

page 46, line 5 from bottom
remove "(reviewed in the next section)"

page 55, line 5 from bottom
Hypothesis: X is a **half**-dimensional submanifold with... instead of n-dimensional

page 58, line 2 of Theorem 8.6
X a **compact** submanifold of dimension $k \geq n$,... assume compactness of X

page 66, last line i.e. footnote 2
... if $\mathbf{Id}-df_p : T_pM \to T_pM$ is nonsingular. not just df_p

page 95, second line
$(\Lambda^\ell T^{1,0}) \otimes (\Lambda^m T^{0,1})$ so $\otimes$ instead of $\wedge$ in the definition of $\Lambda^{\ell,m}$

page 109, line 7
It follows immediately from the previous definition **and from Theorem 15.4** that
add clause

page 135, line 7 from bottom
$V(q) := \boldsymbol{-W_\gamma}$ sign change

page 143, last condition in Proposition 20.2

(d) $F(p) \to +\infty$ *as* $p \to \infty$ *in* V. omit "F is proper, that is,"

page 148, line 3 of part 7.
tautological 1-form twice replace "canonical" by "tautological"

page 165, line 3
whenever there is an **abelian** symmetry group the word "abelian" was missing

page 171, line 6
By the **inverse** function theorem instead of "implicit"

page 212 and subsequent pages
the number π and the projection map π should be distinguished by different symbols

page 226, line 3 of footnote
Z a **compact** manifold of dimension $k \geq n$ with... assume compactness of Z