

Erratum

A “Transversal” Fundamental Theorem for Semi-Dispersing Billiards

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C. Liverani and M.P. Wojtkowski made a remark that the statement (ii) of our Lemma 2.13 is not necessarily true as formulated there. However, it remains valid if we use the norms of the operators $(D'_{x, \varepsilon})^{-1}$, $(D''_{x, \varepsilon})^{-1}$ (cf. (2.8) and (2.9)) as acting in $\mathcal{T}_x \Sigma$ supplied with the configuration space norm $\|dq\|$ instead of the phase space Riemannian metric $\sqrt{(dq)^2 + (dv)^2}$. This change has several consequences which are described in detail as follows:

1. In Definition 5.1, the remark between parentheses is not true, but it is not used later on.
2. In the formula (5.2) it can be noted that $1 \leq \kappa_{n, \delta}(y) \leq \kappa_{n, 0}(y)$.
3. In (ii) of Definition 5.1: the ball $B_\delta(-y)$ should be defined in terms of the degenerate configuration-space-metric $\|dq\|$.
4. Rethinking the proof of Lemma 5.4 we see that the construction of the local invariant manifolds does not use directly the function $z(\cdot)$ appearing in the definition of the sets U_n^b , but, instead, it works with another function $z_{\text{tub}}(\cdot)$ which is just the original z -function given by Sinai and Chernov in S-Ch (1987). Recall that $z_{\text{tub}}(x)$ ($x \in \partial M$) is the supremum of the radii r of all tubular neighborhoods U_r of the projected trajectory segment $\pi(\{S^t x : 0 \leq t \leq \tau(x)\})$ in the configuration space, for which the set $\{y \in M : p(y) = p(x) \text{ and } \pi(y) \in U_r\}$ does not intersect the set of singular reflections. Notice that $z_{\text{tub}}(\cdot)$ is closely related to the metric $\|dq\|$ being a Lyapunov one in the local orthogonal manifolds. A simple geometric argument shows that $z(x) \leq z_{\text{tub}}(x)$.

The corrections of some other discovered errors are listed below:

- a) The set treated in the second paragraph after Condition 2.1 has not only measure zero, but it is actually empty.
- b) Convergence of the continued fraction (2.6) is proved in Lemma 1 of S-Ch (1982) for every $x \in M$ such that $t_n \rightarrow \infty$ as $n \rightarrow \infty$, a property valid for all phase points $x \in M^*$ because there are no trajectories with infinitely many collisions in a finite time interval.