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*Left orderability, foliations, and transverse $(\pi_1, \mathbb{R})$ structures for 3-manifolds with sphere boundary*

Let $M$ be a closed orientable irreducible 3-manifold such that $\pi_1(M)$ is left orderable.

(a) Let $M_0 = M - Int(B^3)$, where $B^3$ is a 3-ball in $M$. We show that there exists a Reebless co-orientable foliation $\mathcal{F}$ in $M_0$, whose leaves may be transverse to $\partial M_0$ or tangent to $\partial M_0$ at their intersections with $\partial M_0$, such that $\mathcal{F}$ has a transverse $(\pi_1(M_0), \mathbb{R})$ structure and that $\mathcal{F}$ is analogous to taut foliations (in closed 3-manifolds) in the following sense: there exists a compact 1-manifold (i.e. a finite union of properly embedded arcs and/or simple closed curves) transverse to $\mathcal{F}$ that intersects every leaf of $\mathcal{F}$.

(b) We have a process to produce a foliation $\mathcal{F}$ as given in (a), which depends on the choice of a left-invariant order of $\pi_1(M)$ and certain fundamental domain $\Gamma$ of $M$. If $M$ admits a taut foliation that has a transverse $(\pi_1(M), \mathbb{R})$ structure, then some resulting foliation of our process can extend to a taut foliation in $M$ that has a transverse $(\pi_1(M), \mathbb{R})$ structure. If $M$ admits an $\mathbb{R}$-covered foliation, then some resulting foliation of our process can extend to an $\mathbb{R}$-covered foliation in $M$. Furthermore, we conjecture that every resulting foliation of our process can extend to a taut foliation in $M$ that has a transverse $(\pi_1(M), \mathbb{R})$ structure.