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Taut Foliations and Seiberg-Witten Eqns.

Let

$Y = \text{smooth 3-mfd, oriented}$

$F = \text{codim 1, oriented}$

F is taut if $\forall p \in Y, \exists S' \in Y$ s.t.

S' passes through p and is transverse to F

Thm: $Y = S^2 \times S^1$ and Y support a taut foliation

$\Rightarrow Y$ is irreducible

Thm: If $b_1(Y) \geq 1$, the converse holds

If $b(Y) = 0$, Y is not an L-space.

$HM^{\text{red}}(Y) \neq 0$ See L-Space conjecture
(reduced Floer homology)

Question - If F_1, F_2 are homotopic, are they homotopic through foliations?

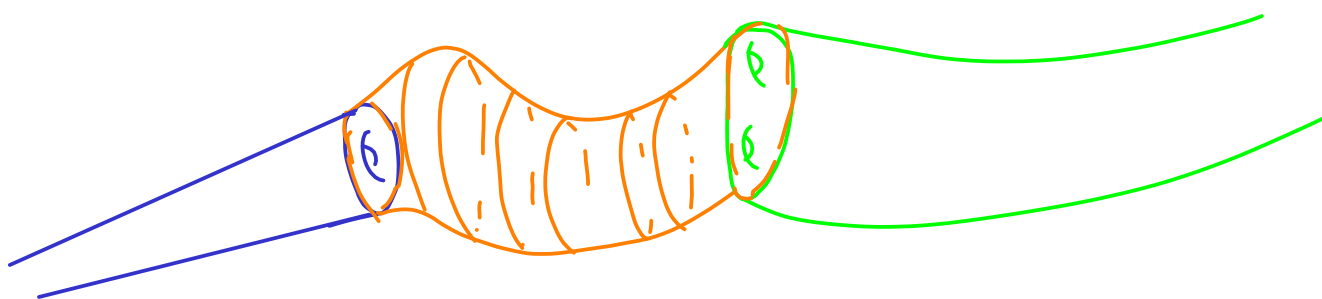
Seiberg-Witten Theory

Essentially the Morse theory of a certain functional on a manifold?

Critical pts \rightarrow Solns to SW-egns on Y

Flow lines \rightarrow " " " " $Y \times \mathbb{R}$

Can count over cobordism



Can use this idea to construct an invariant

\rightarrow Allows reproving old results without heavy theorems

\rightarrow Possible new results, can look at

\mathcal{M}_J = Moduli space of J -holomorphic curves

its cobordism class is a foliation invariant

(Can control non-compact parts when there's a group action.)