

Lemma (1) Sign does not depend on the choice of local ori. of N^3 at y .

(2) If we change the ori. of M^4 , then the sign changes.

Theorem (T. Yamamoto - S)

$f : M^4 \rightarrow N^3 \in C^\infty$ stable
↑ closed oriented

$\Rightarrow \| \text{III}^d(f) \| = \text{signature of } M^4$ (*)

Idea for the Proof

- Both $\| \text{III}^d(f) \|$ & sign. of M^4 are ori. cob. inv.
 - ori. cob. grp $\Omega_4 \xrightarrow[\cong]{\text{sign.}} \mathbb{Z}$
- \Rightarrow suffices to check (*) for a generator. //