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A characterization of alternating links in thickened surfaces

We use an extension of Gordon-Litherland pairing to thickened surfaces to give a topological characterization of alternating links in thickened surfaces. If Σ is a closed oriented surface and F is a compact unoriented surface in $\Sigma \times I$, then the Gordon-Litherland pairing defines a symmetric bilinear pairing on the first homology of F . A compact surface in $\Sigma \times I$ is called definite if its Gordon-Litherland pairing is a definite form. We prove that a non-split link L in a thickened surface is alternating if and only if it bounds two definite surfaces of opposite sign. This is joint work with Hans U. Boden.