Gravitational consequences of confined fields in braneworlds
STEPHEN GREEN, University of Chicago — In the braneworld scenario, matter
fields are usually assumed to be confined to branes in a higher dimensional spacetime,
with a stress energy tensor that is sharply peaked on the brane. A field theoretic
way to achieve this is by coupling a bulk field to a topological defect which makes up
the brane. We point out that in contrast to fermion fields, the stress energy tensor of
a confined scalar field contains a term that is of the form of the second derivative of
a sharply peaked function. This produces large metric perturbations on the brane.
However, the resulting gravitational effect is equivalent to a local self-interaction
term, and may be negated by artificially inserting an opposite self-interaction for
the underlying theory. We comment on the possible generalization to other bosonic
fields as well as the potential observability.

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