

Interaction between Dark matter and Dark energy

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A Field Theory Model for Dark Matter and Dark Energy in Interaction

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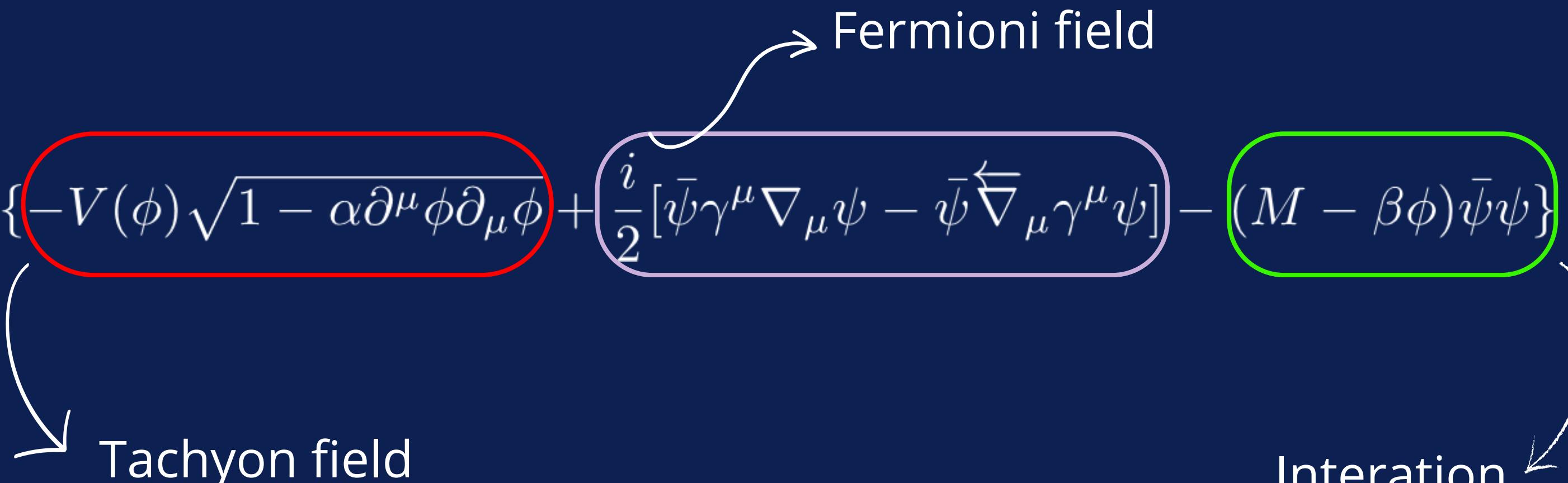
My objective is to make a perturbation to the energy-momentum tensor of the lagrangian presented in this paper, and afterwards apply the equation in the CLASS program.

Lagrangian

$$L = \sqrt{-g} \{ -V(\phi) \sqrt{1 - \alpha \partial^\mu \phi \partial_\mu \phi} + \frac{i}{2} [\bar{\psi} \gamma^\mu \nabla_\mu \psi - \bar{\psi} \overleftarrow{\nabla}_\mu \gamma^\mu \psi] - (M - \beta \phi) \bar{\psi} \psi \}$$

Lagrangian

$$L = \sqrt{-g} \{ -V(\phi) \sqrt{1 - \alpha \partial^\mu \phi \partial_\mu \phi} + \frac{i}{2} [\bar{\psi} \gamma^\mu \nabla_\mu \psi - \bar{\psi} \overleftarrow{\nabla}_\mu \gamma^\mu \psi] - (M - \beta \phi) \bar{\psi} \psi \}$$

A diagram illustrating the components of a Lagrangian. The equation is enclosed in a horizontal line. Three terms are highlighted with rounded rectangles: the first term $-V(\phi) \sqrt{1 - \alpha \partial^\mu \phi \partial_\mu \phi}$ is circled in red and labeled "Tachyon field" with a curved arrow; the second term $\frac{i}{2} [\bar{\psi} \gamma^\mu \nabla_\mu \psi - \bar{\psi} \overleftarrow{\nabla}_\mu \gamma^\mu \psi]$ is circled in purple and labeled "Fermion field" with a curved arrow; the third term $(M - \beta \phi) \bar{\psi} \psi$ is circled in green and labeled "Interaction" with a curved arrow.

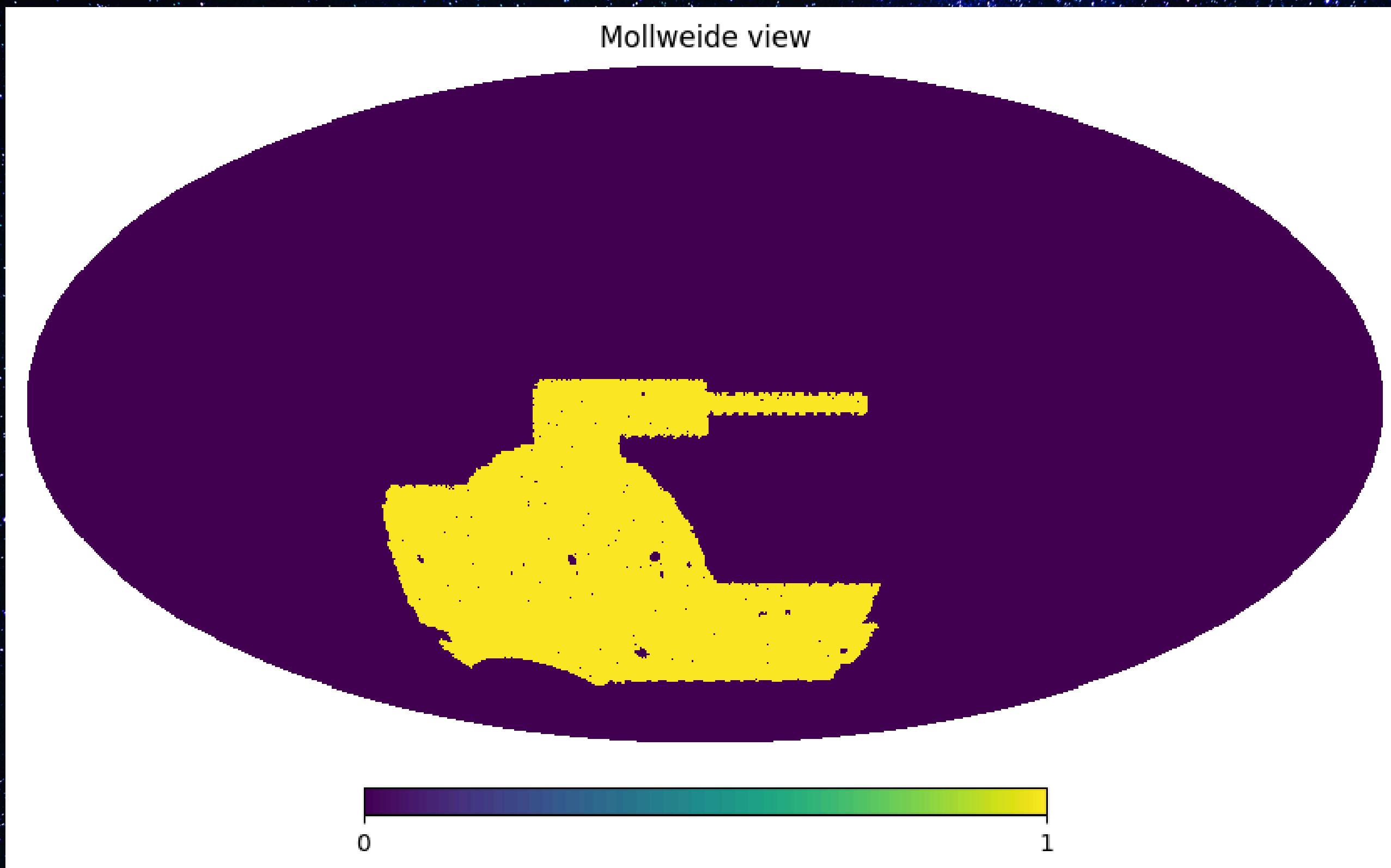
Energy-momentum tensor

$$\tilde{T}_{\mu\nu} = \frac{i}{2} (\bar{\psi} \gamma_{(\nu} \tilde{D}_{\mu)} \psi - \tilde{\bar{D}}_{(\mu} \psi \bar{\gamma}_{\nu)} \psi) - \tilde{L} g_{\mu\nu}$$

Another works

- Create quasar maps (overdensity)
- Skarab

Another works



Thank you!