

Towards a Unified Numerical Framework for Quantum Mechanical Simulations

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$$\Sigma_{ij}^{<,2B}(t_a, t_b) = \sum_{klmnr s} w_{ikms} (w_{ljrm} - w_{njrl}) G_{kl}^{<}(t_a, t_b) G_{mn}^{<}(t_a, t_b) G_{rs}^{>}(t_b, t_a)$$

Mathematical model

?

Software

Hardware



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Mathematical model

Qubus tensor framework



Software

Hardware



Key features

- Syntax inspired by the mathematical notation.
- No need for manual code optimization.
- Supports a diverse set of architectures.

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Sigma =

```
def_tensor (i, j, ta, tb) [ sum(w(i, k, m, s) * (w(l, j, r, n) - w(n, j, r, l)) *
                             Gl(k, l, ta, tb) * Gl(m, n, ta, tb) * Gg(r, s, tb, ta), {k, l, m, n, r, s}) ]
```

Qubus tensor framework



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