Rethinking Flavor

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with
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20th of February 2017
St. Goar
Germany

NAWI Graz
Natural Sciences

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- No QED: Ws and Zs are degenerate
- Couplings g, v, λ and some numbers f^{abc} and t^{ij}_a

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- Global SU(2) Higgs custodial (flavor) symmetry
  - Acts as right-transformation on the Higgs field only

$$W^a_\mu \to W^a_\mu \qquad h_i \to h_i + a^{ij} h_j + b^{ij} h_j^*$$

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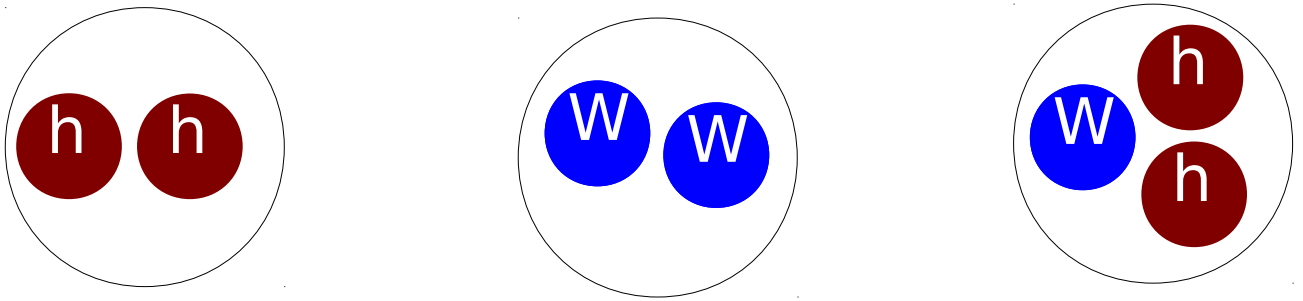

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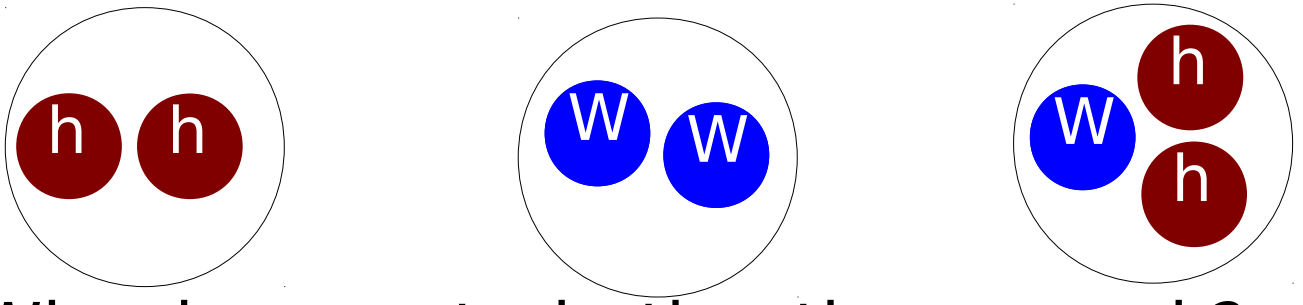

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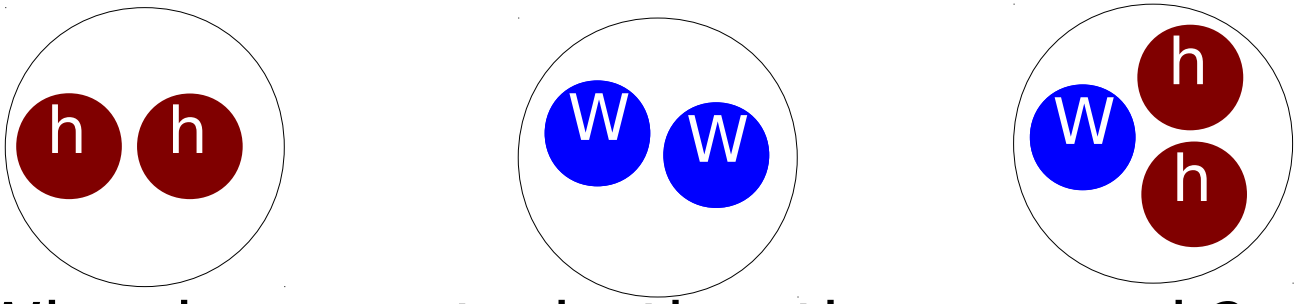

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2 x Higgs mass: Scattering state

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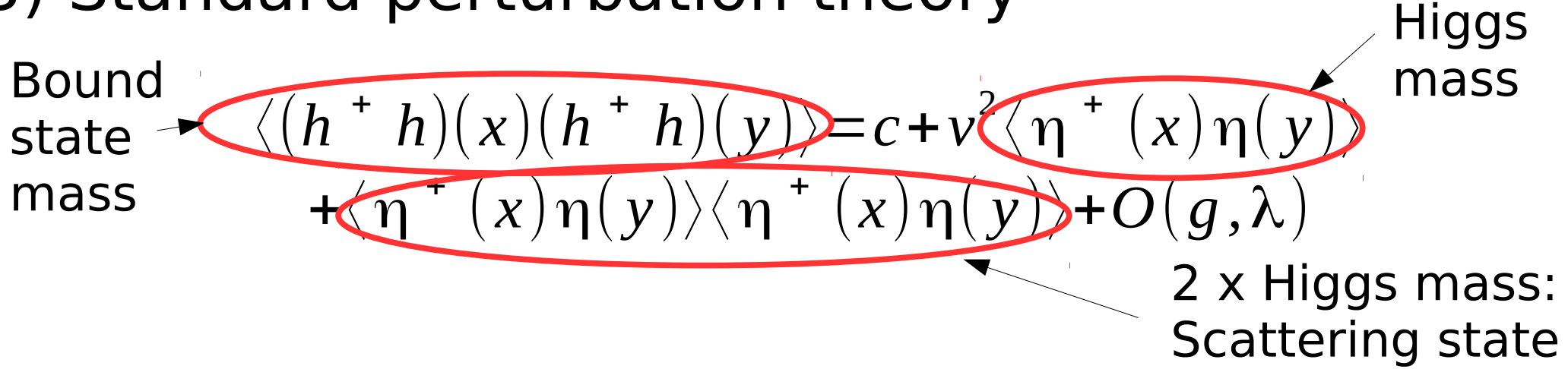

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- Deeply-bound relativistic state -not like QCD
- Mass defect~constituent mass – requires QFT

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  - Weak triplet transformed to custodial triplet

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- Hard to test – but maybe even more possibilities

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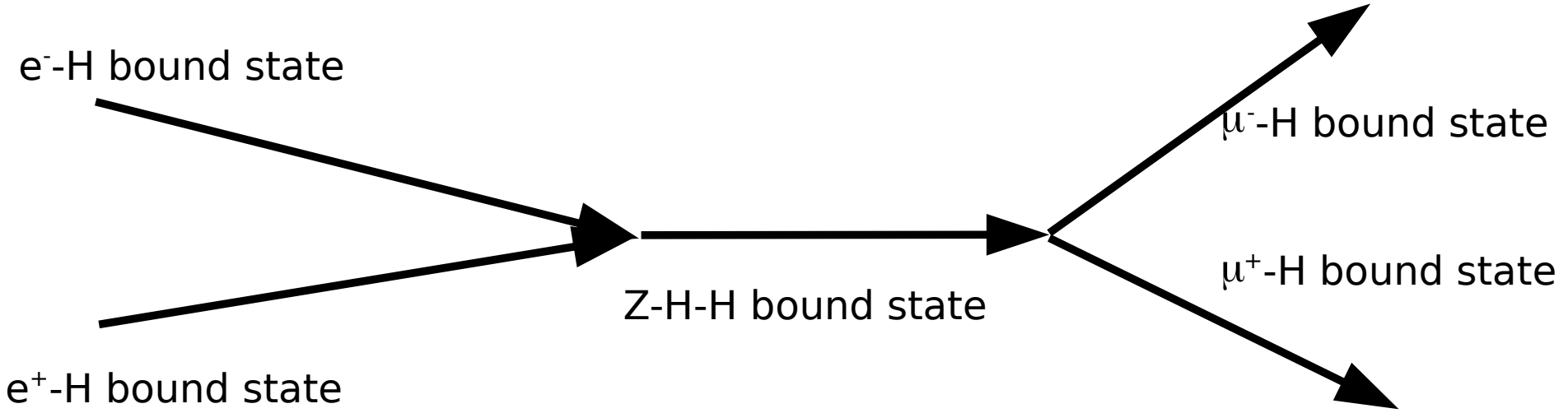

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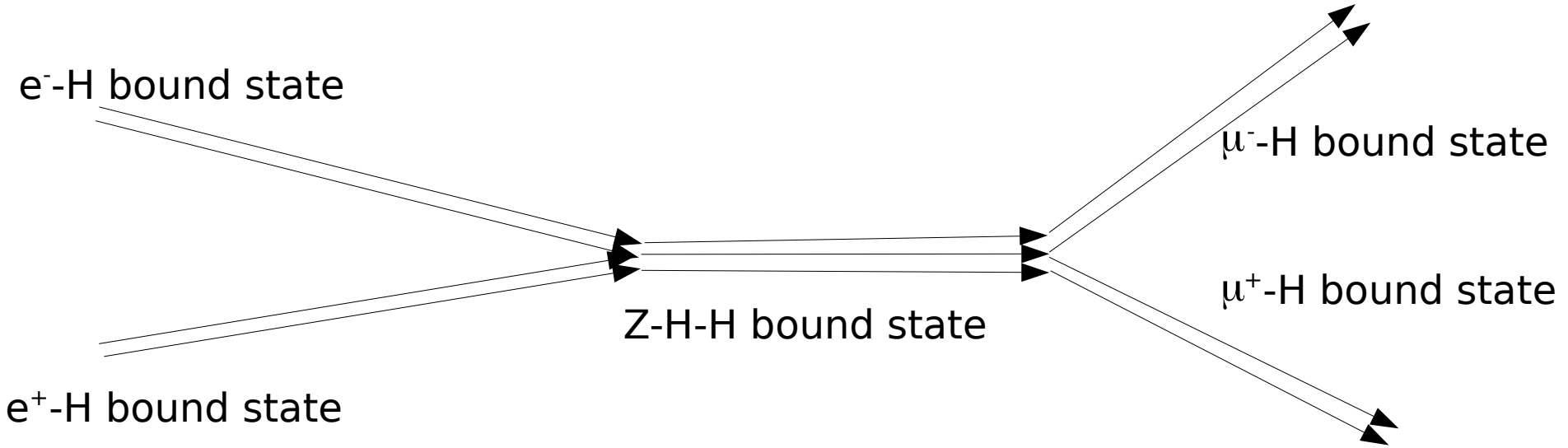

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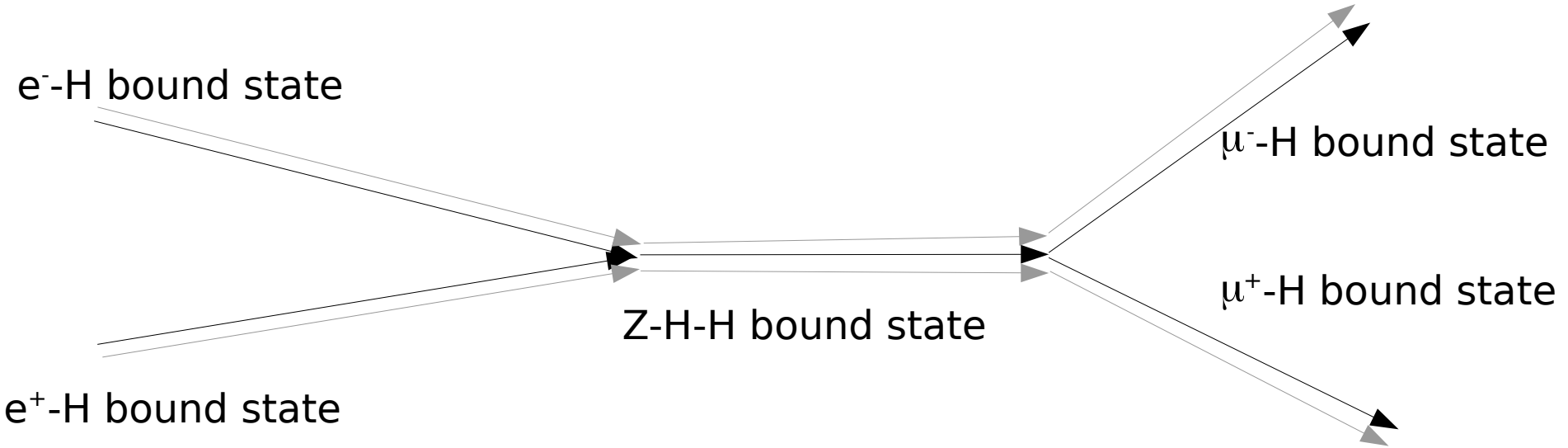

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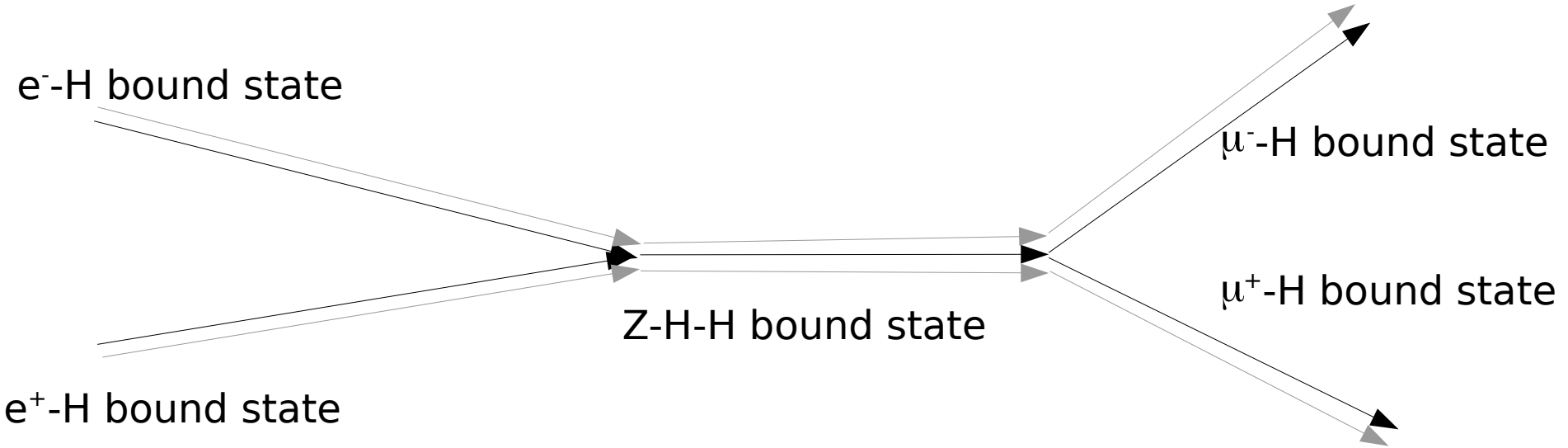

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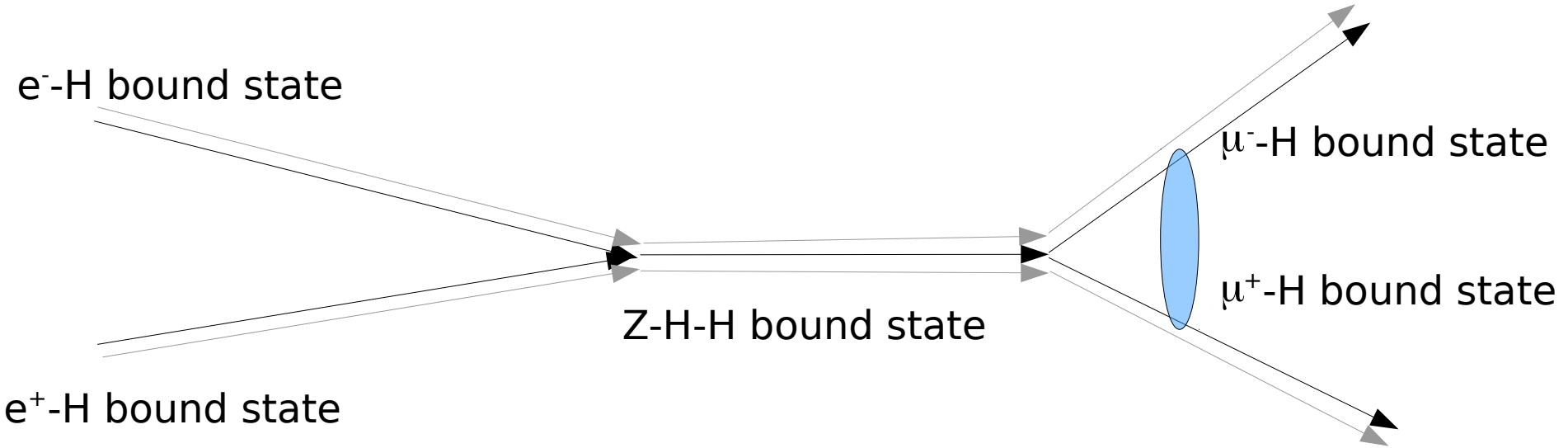

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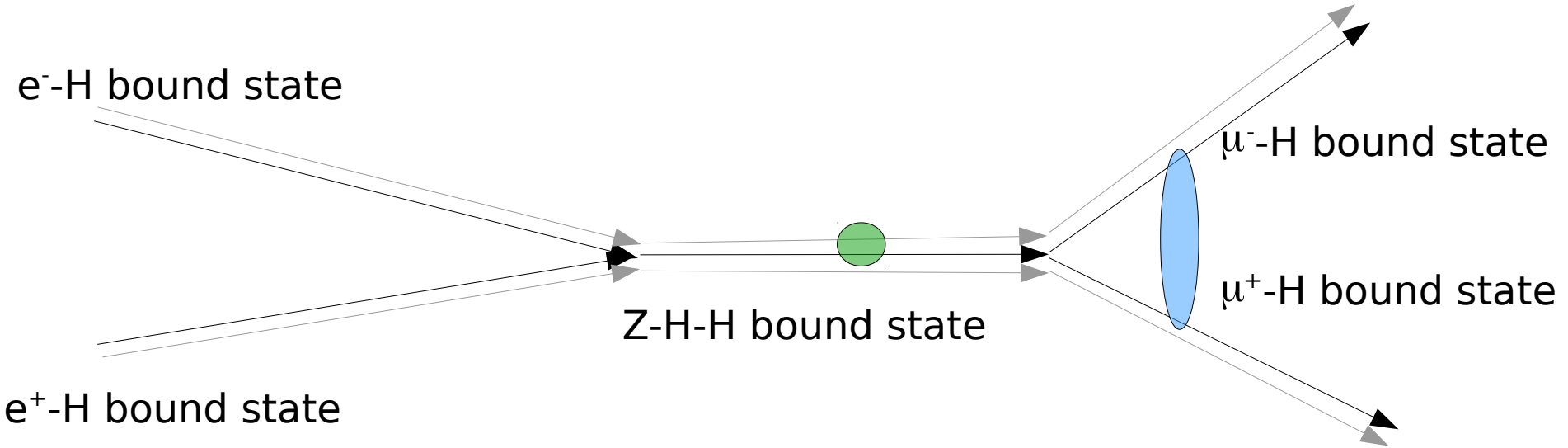

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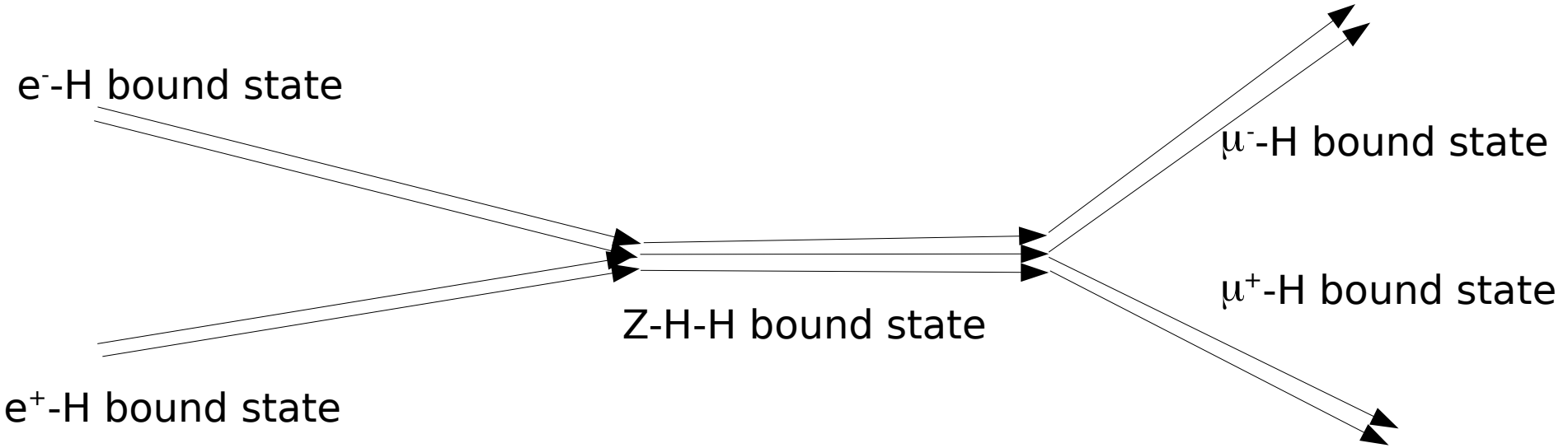

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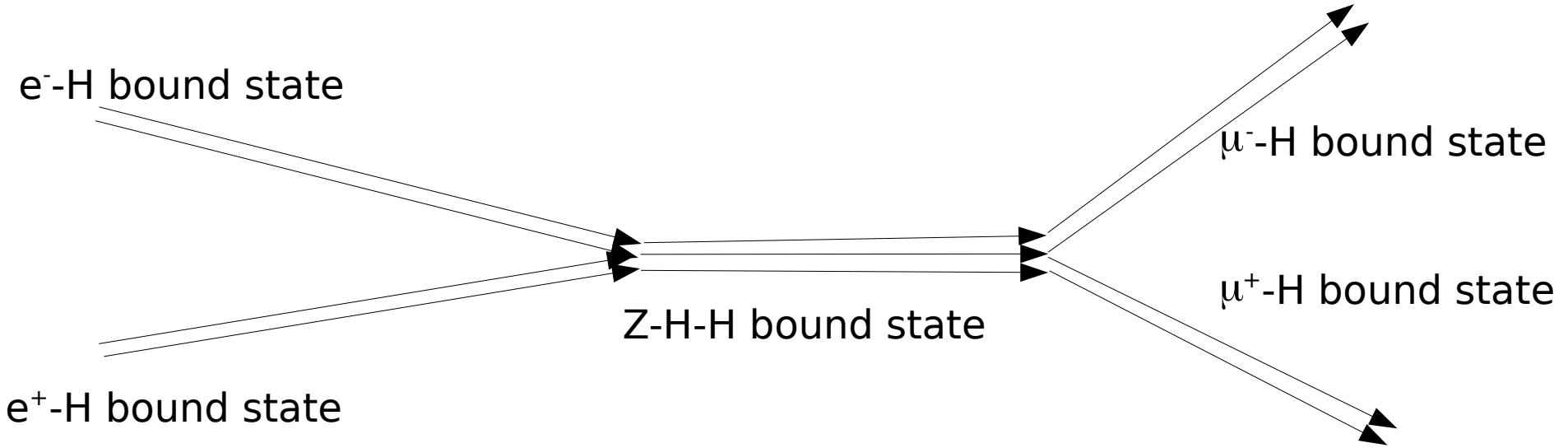

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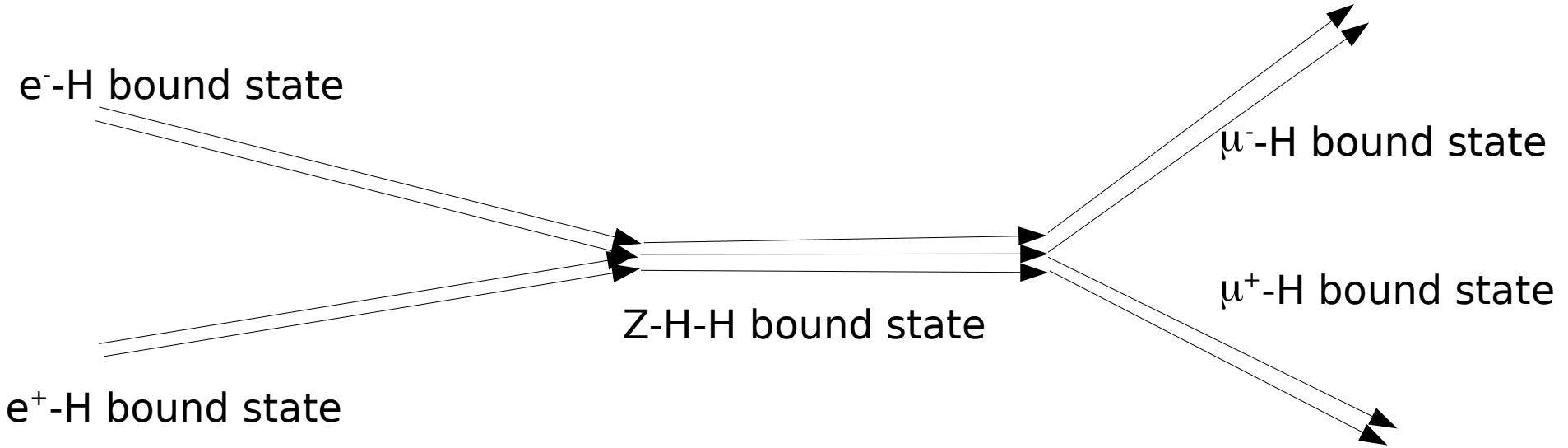

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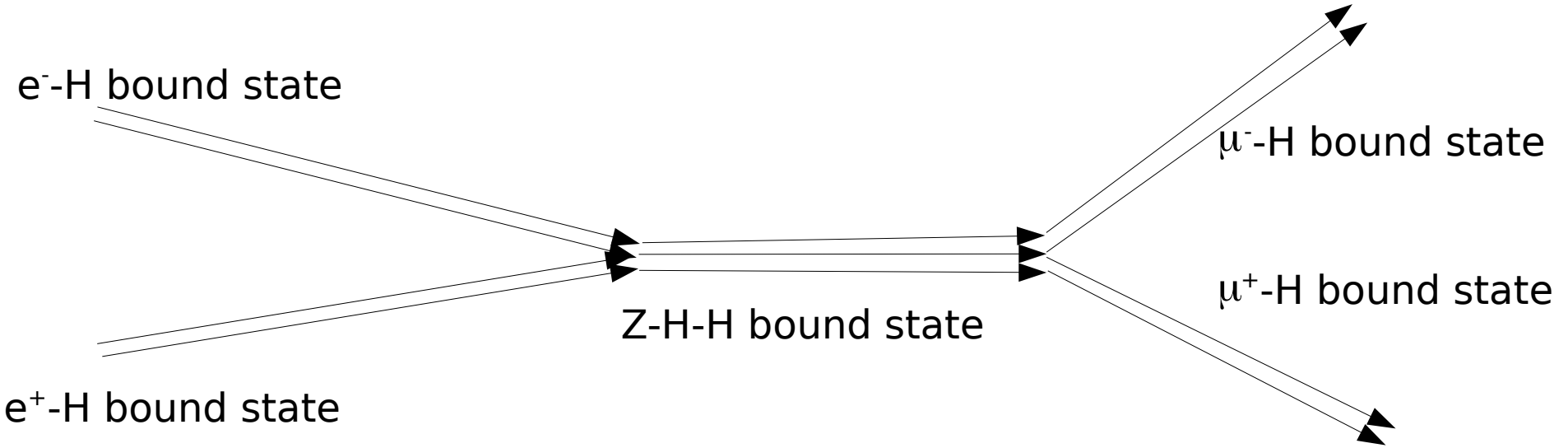

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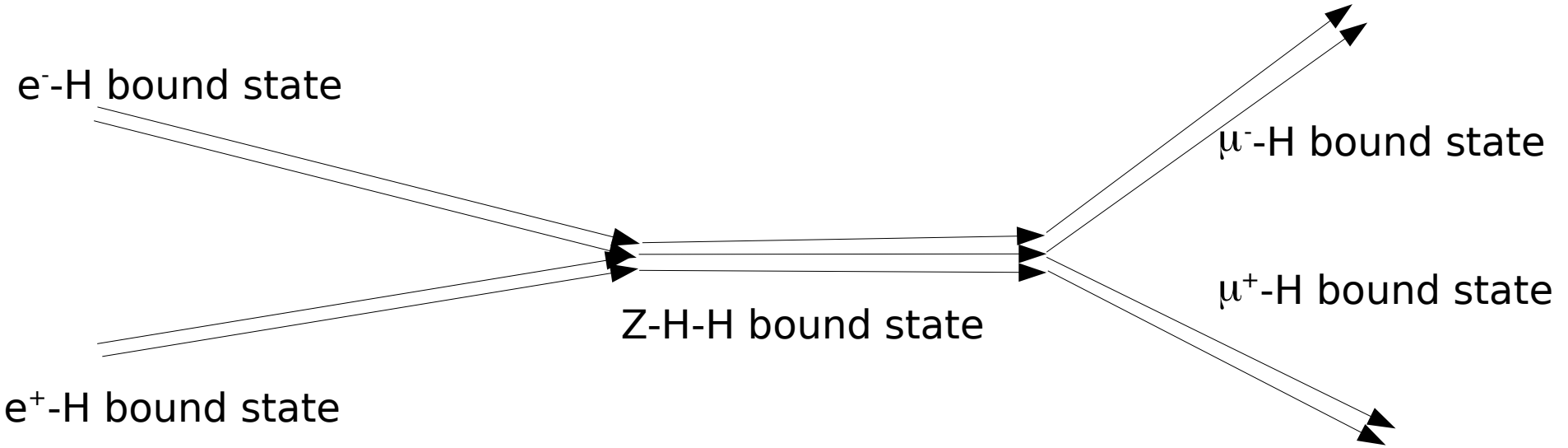

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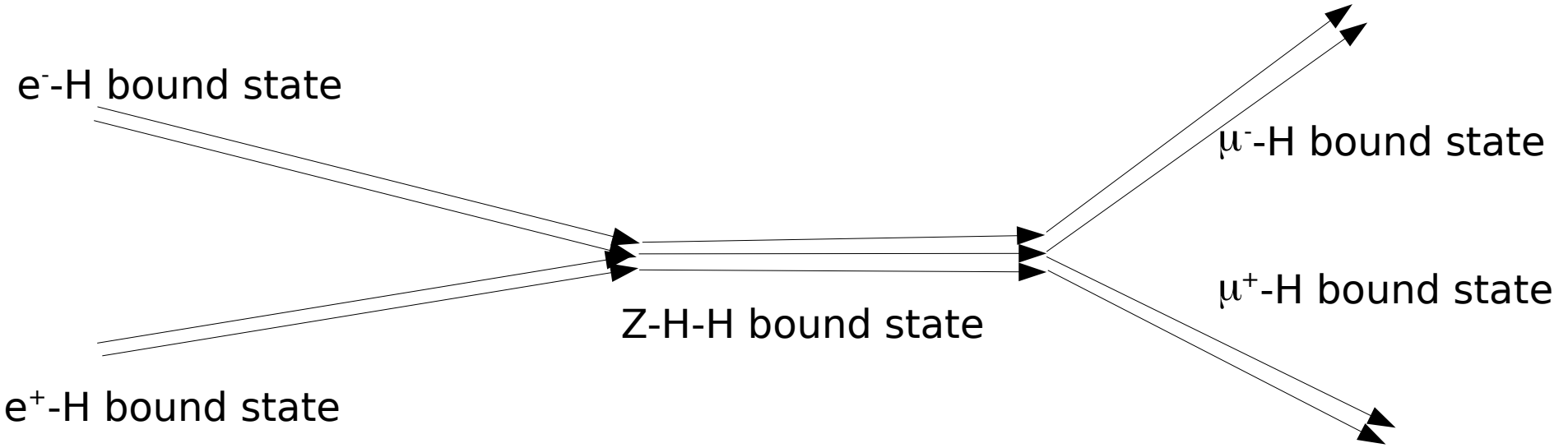

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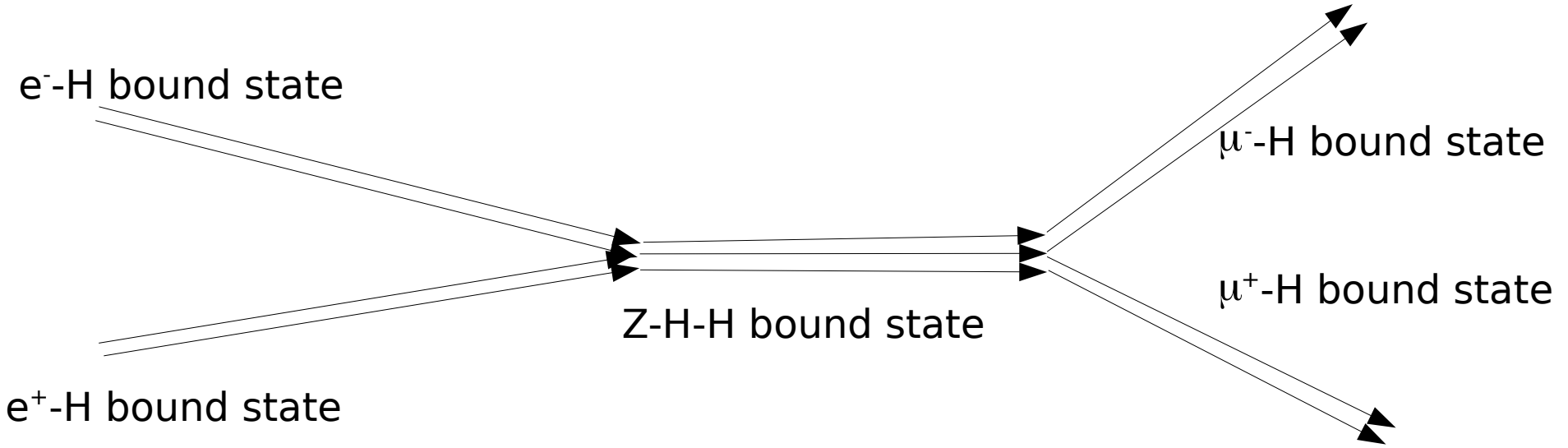

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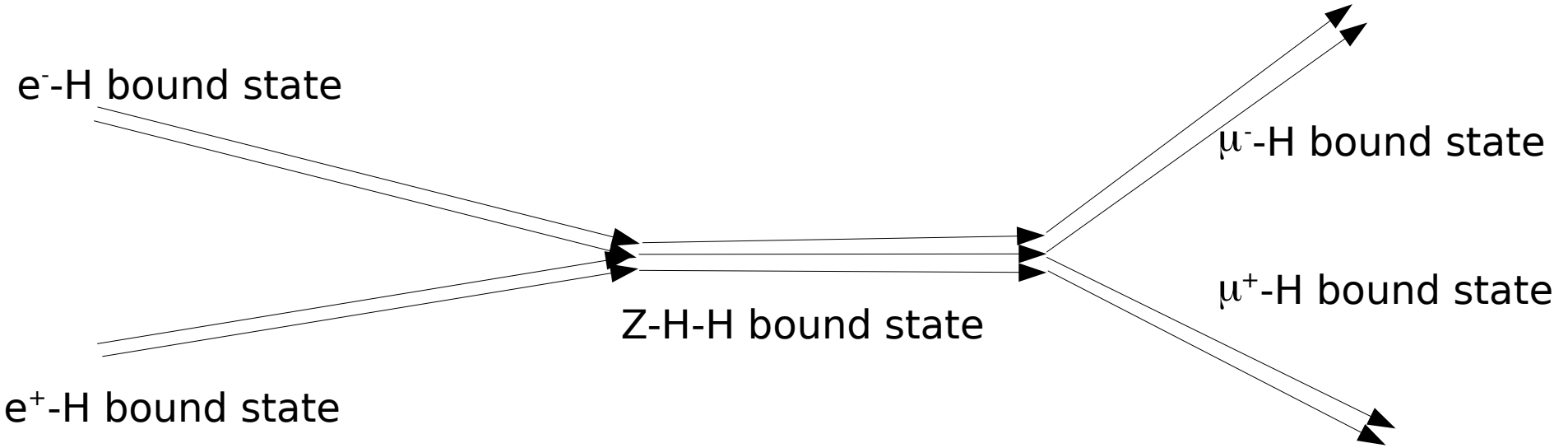

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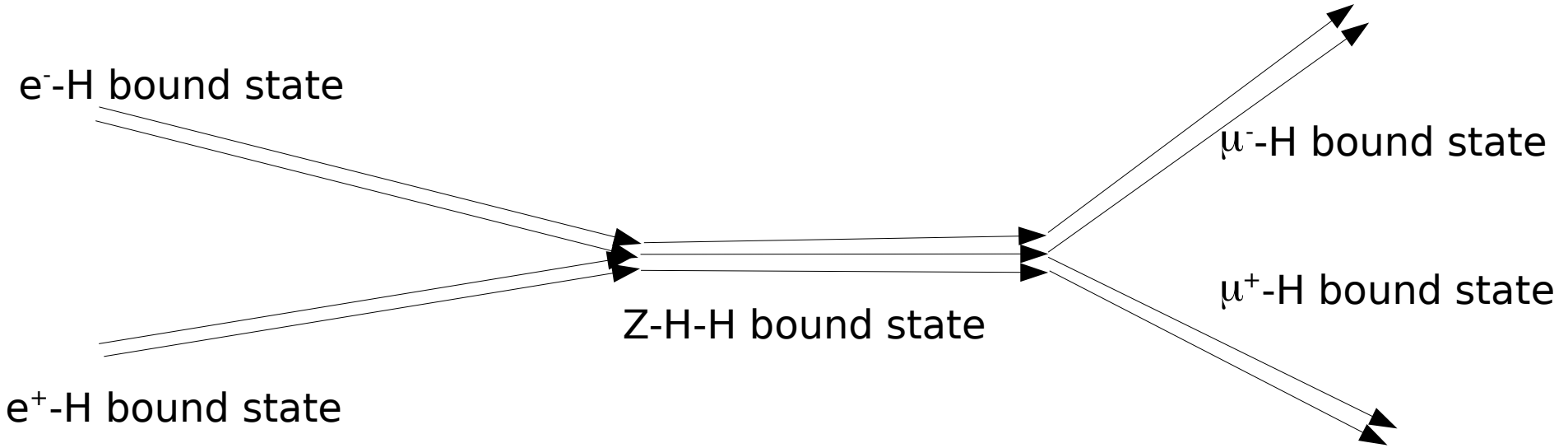

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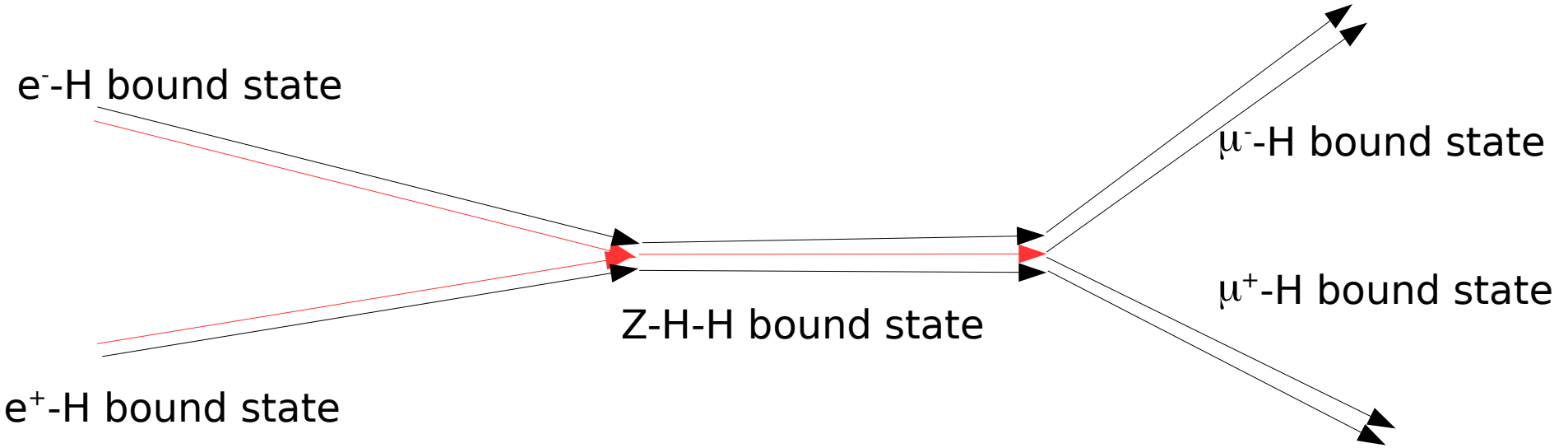

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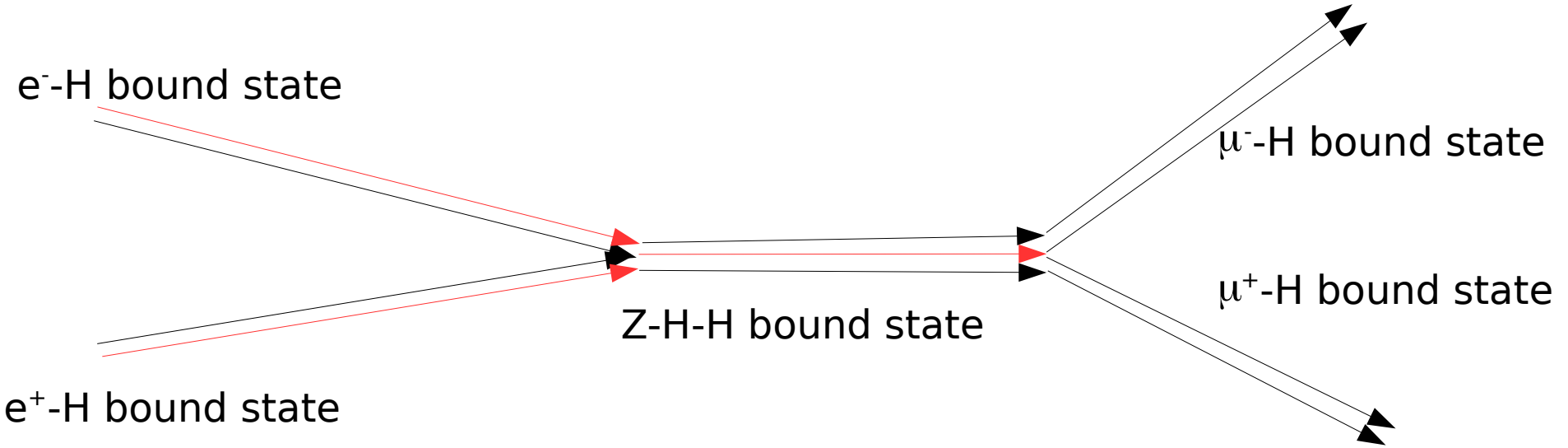

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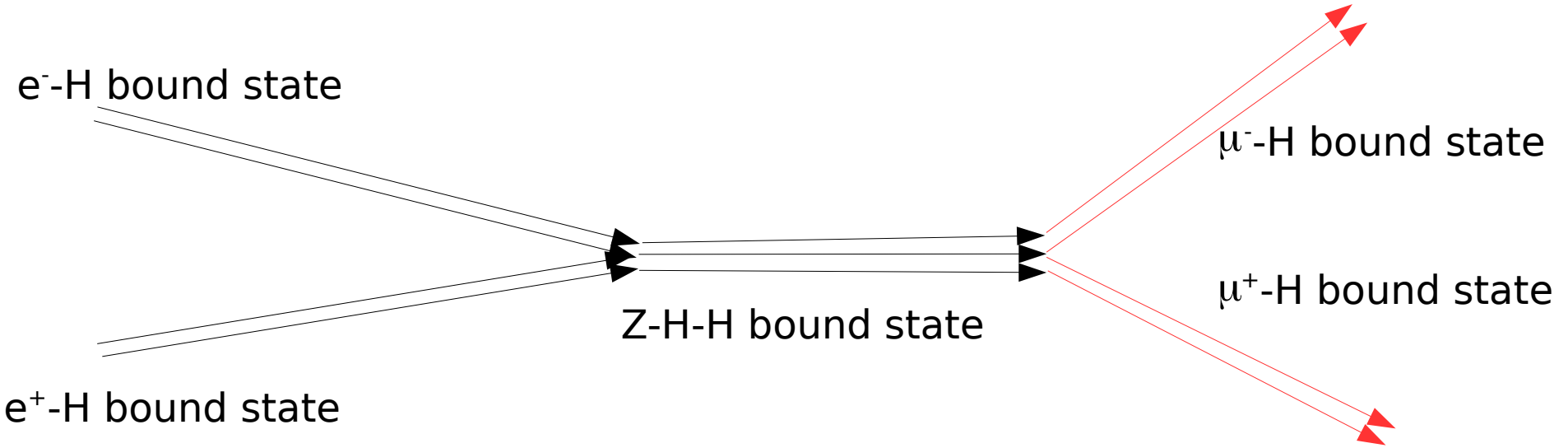

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- Fragmentation 100% efficient – like for quarks

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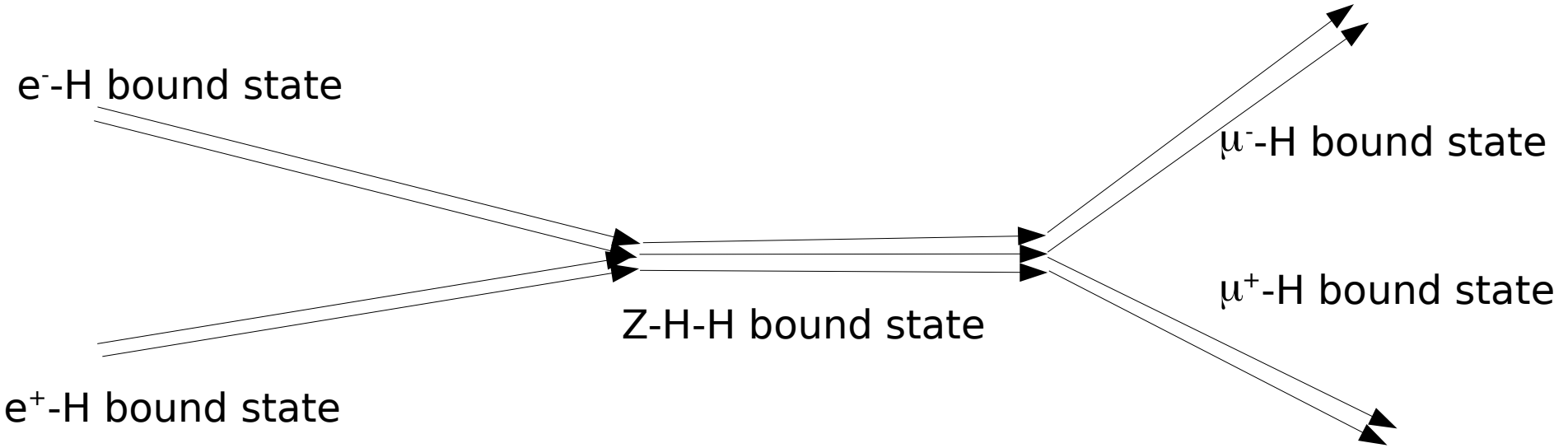

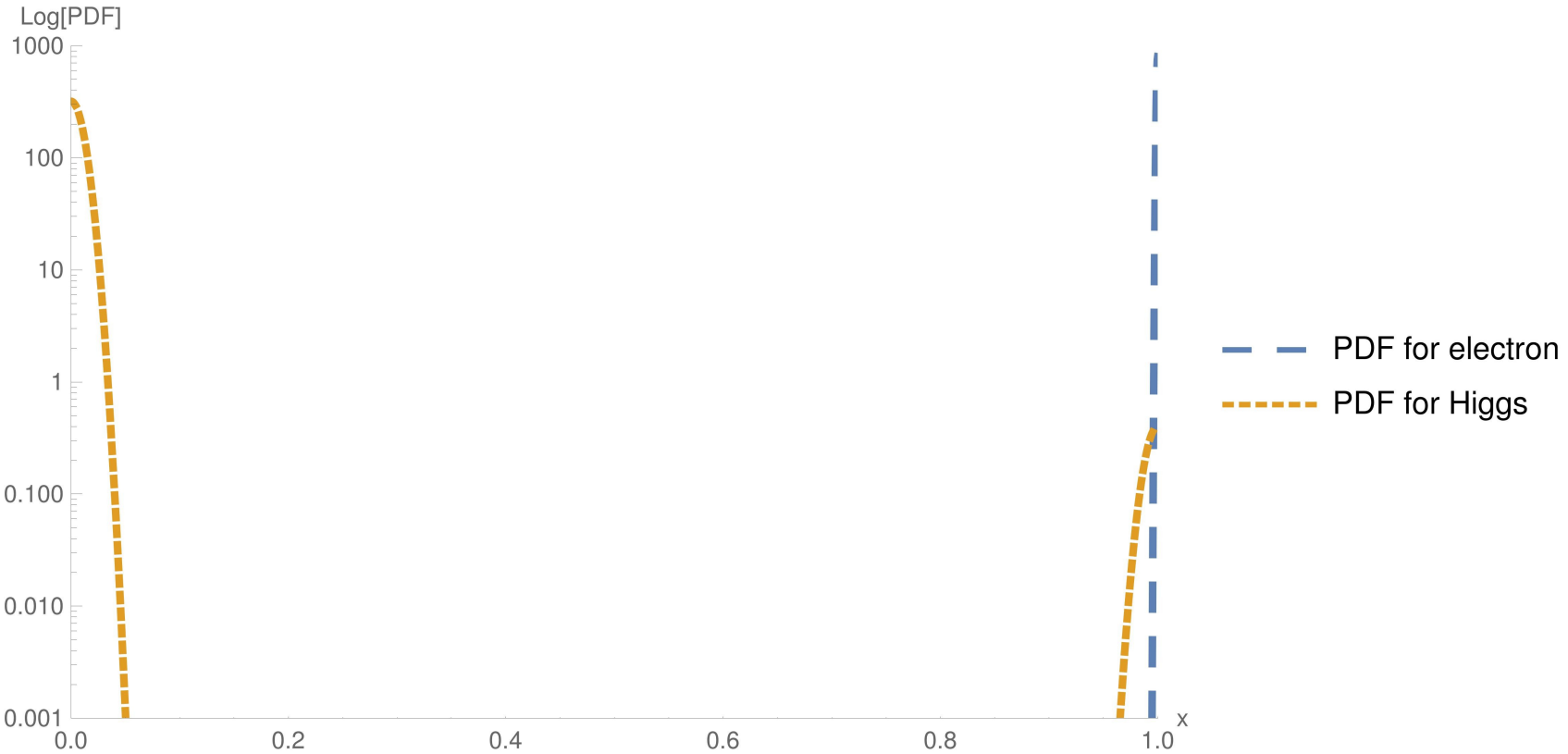

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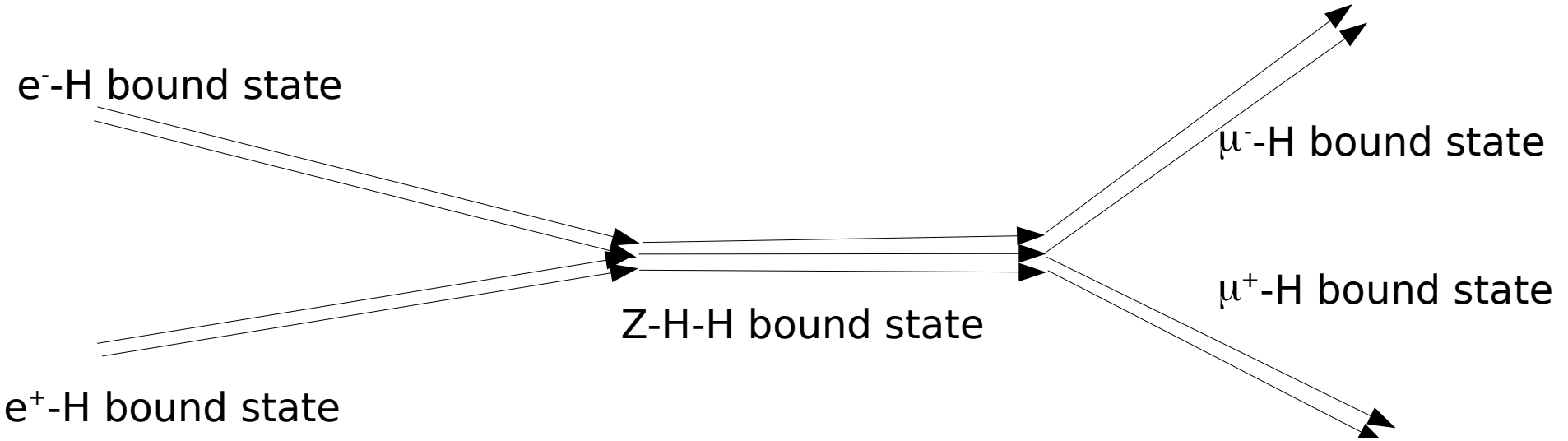

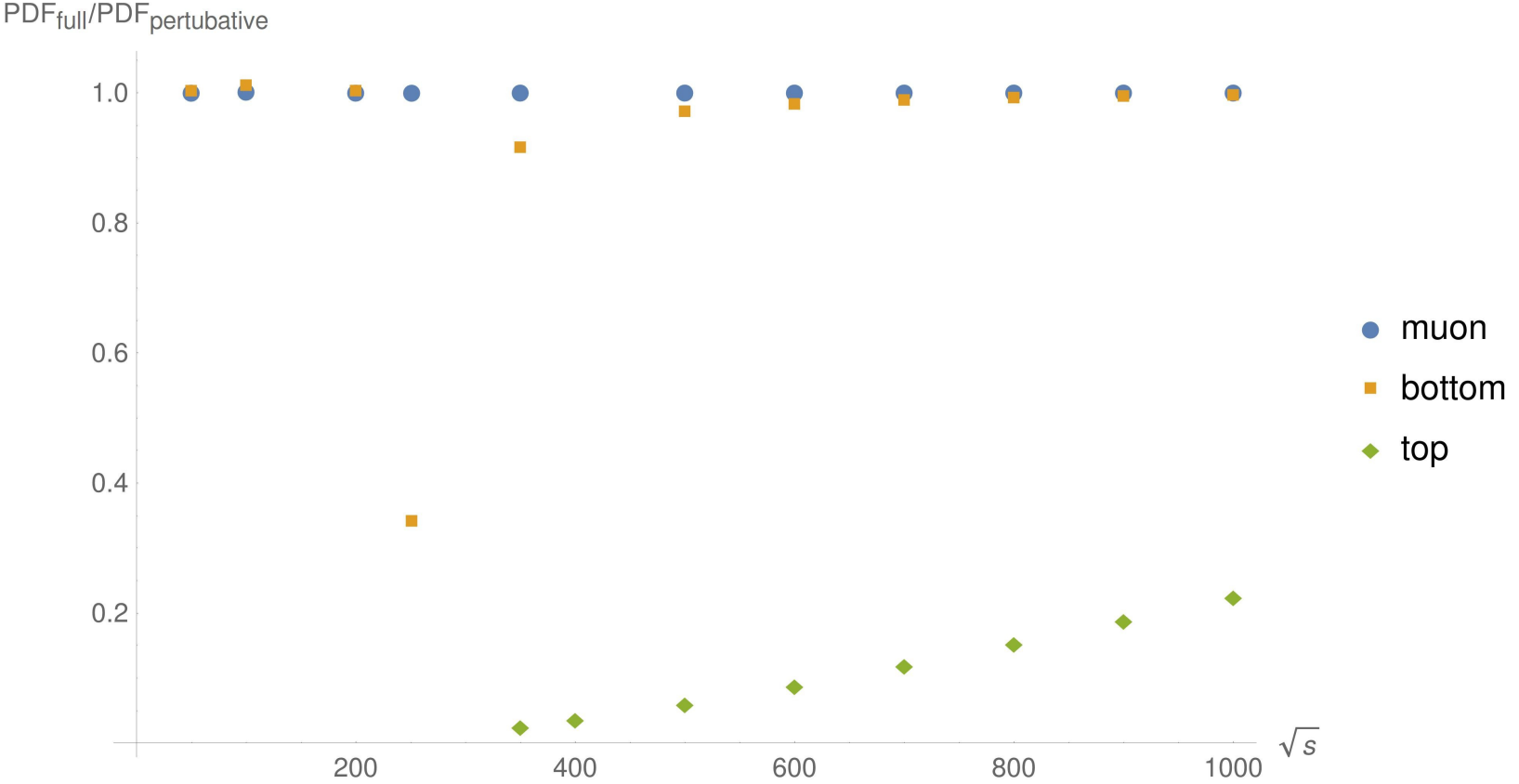

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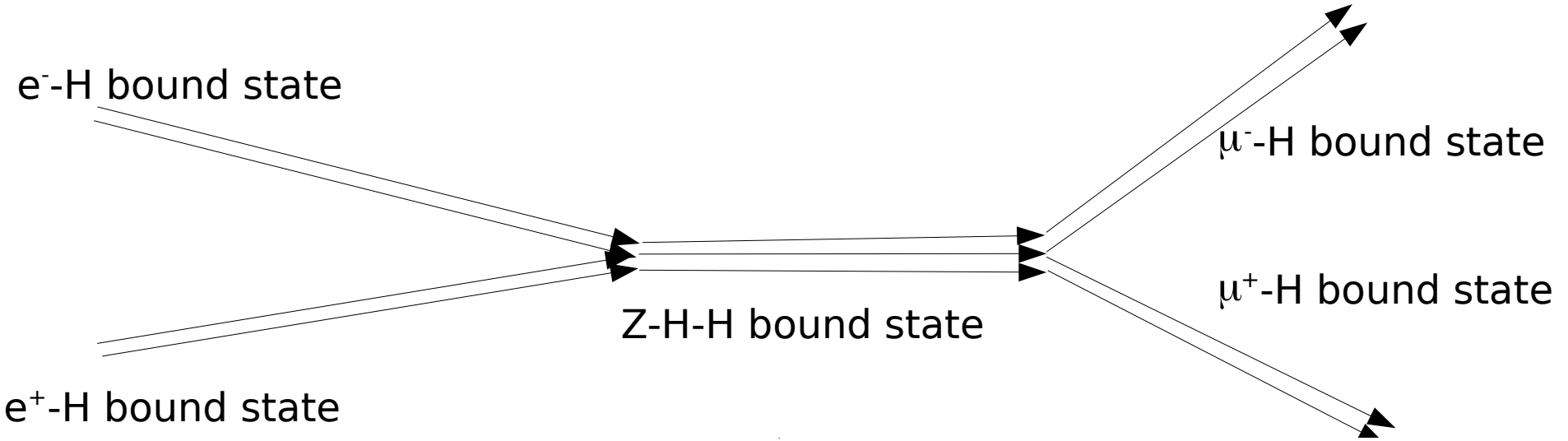

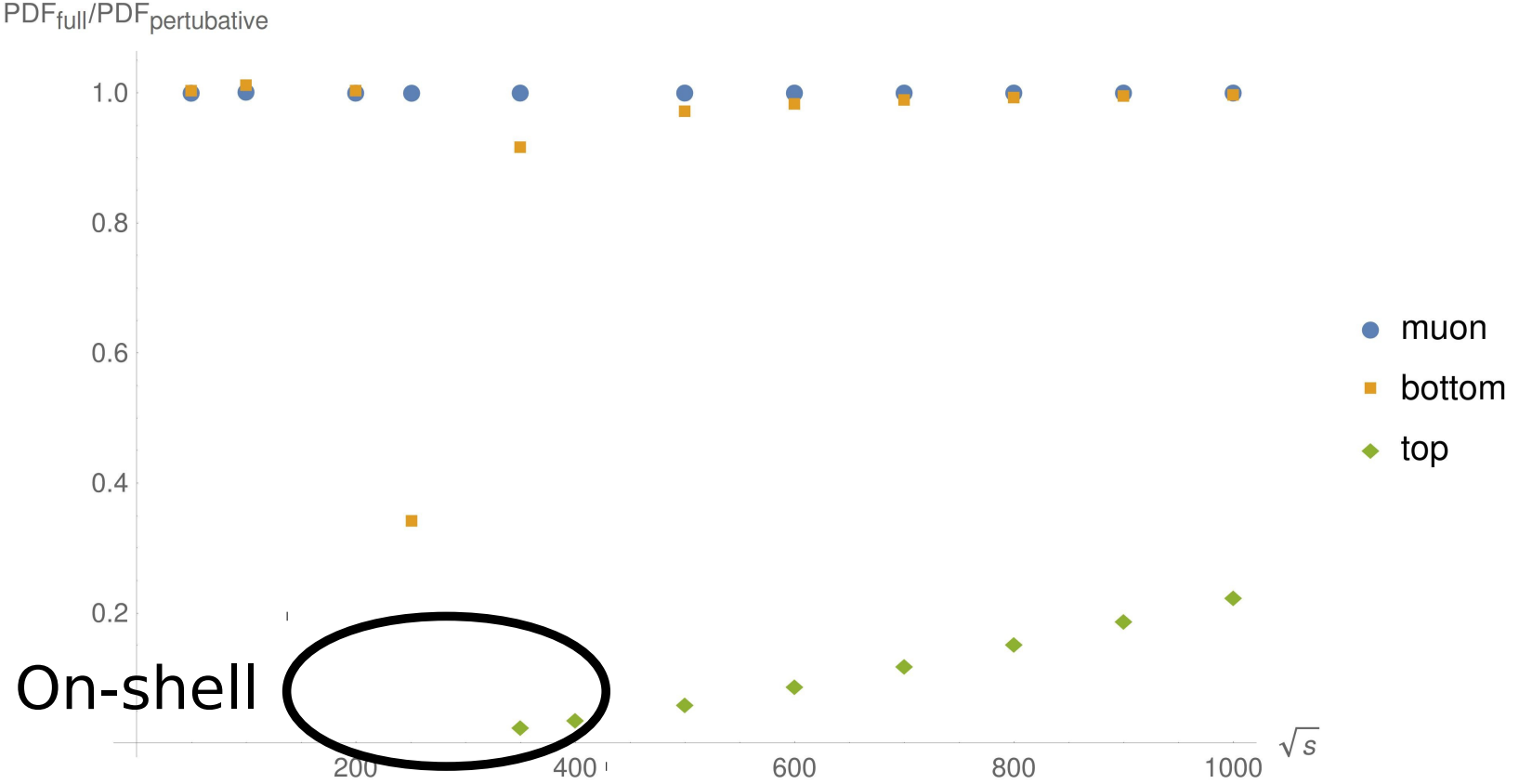

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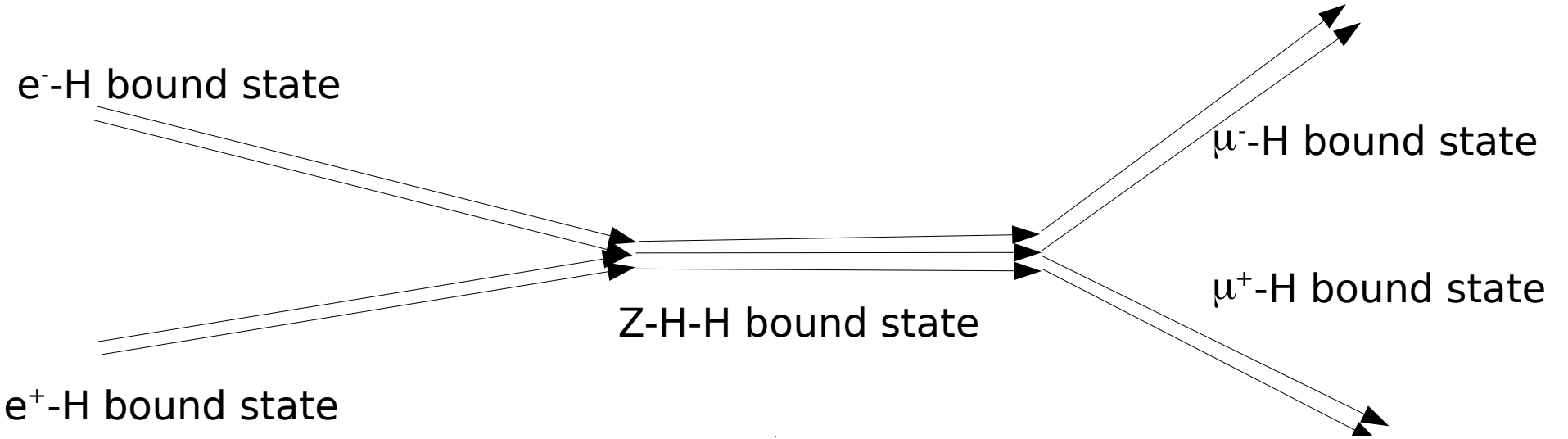

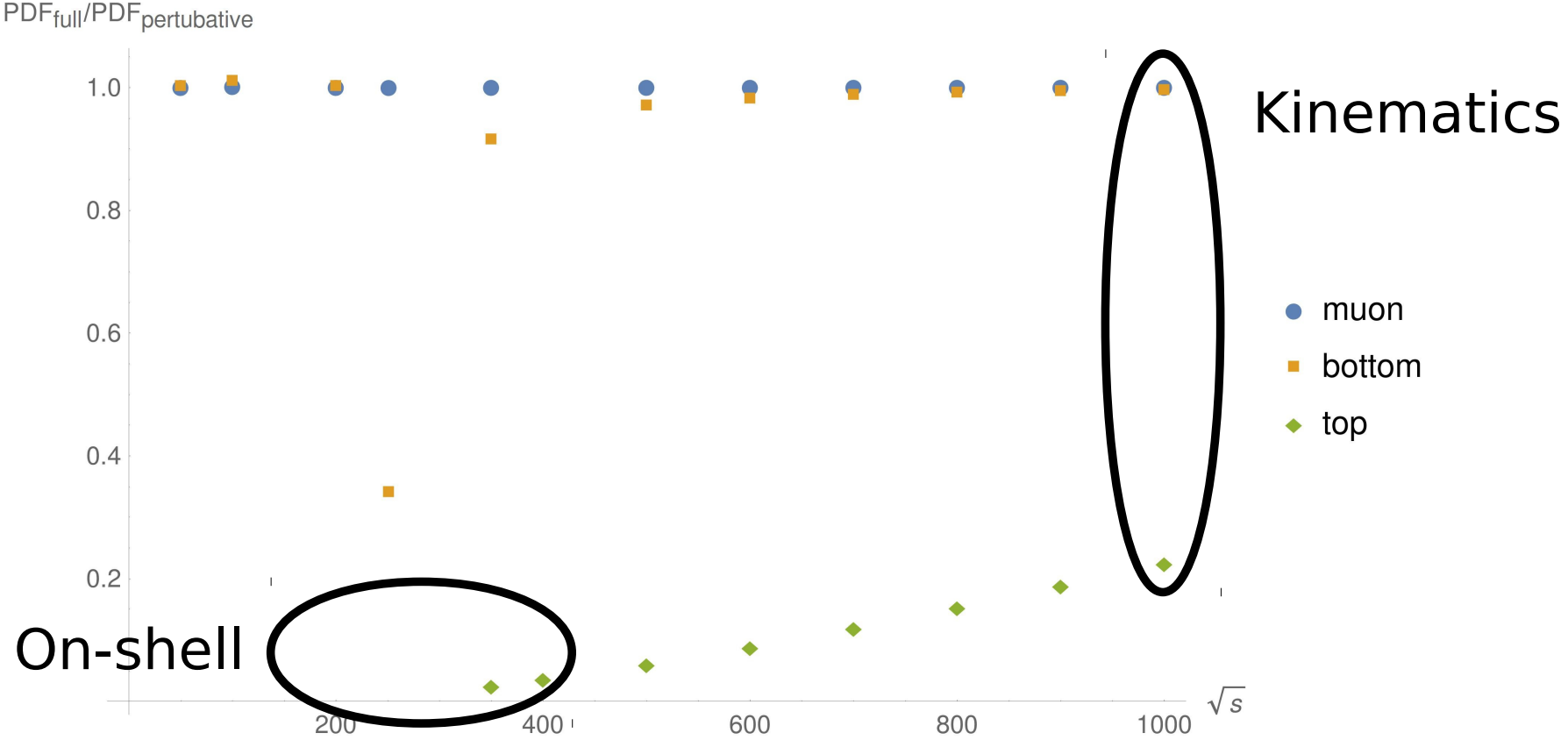

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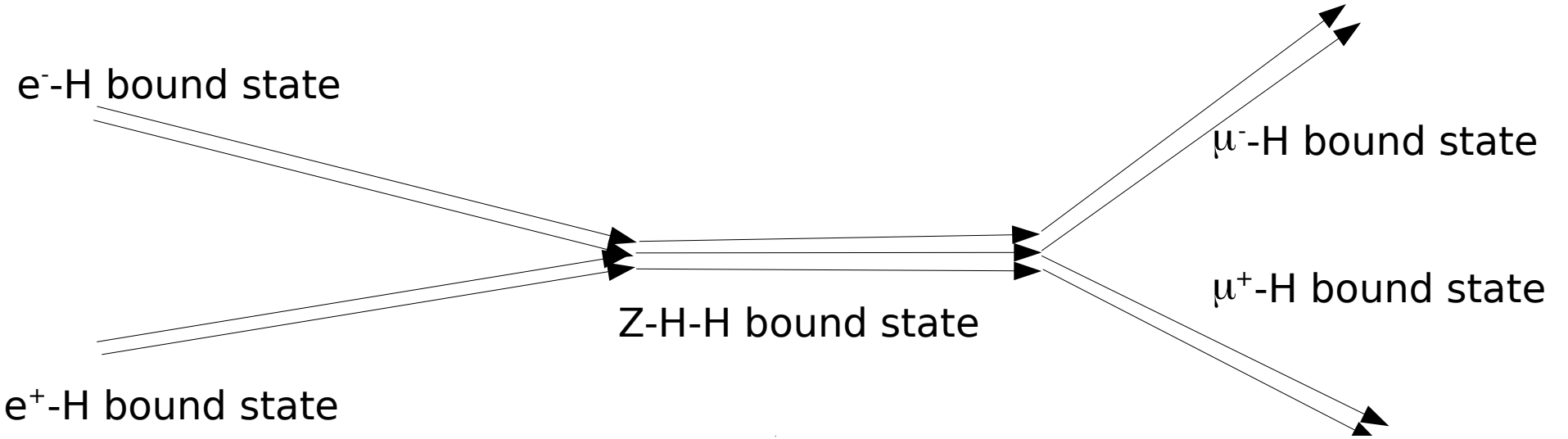

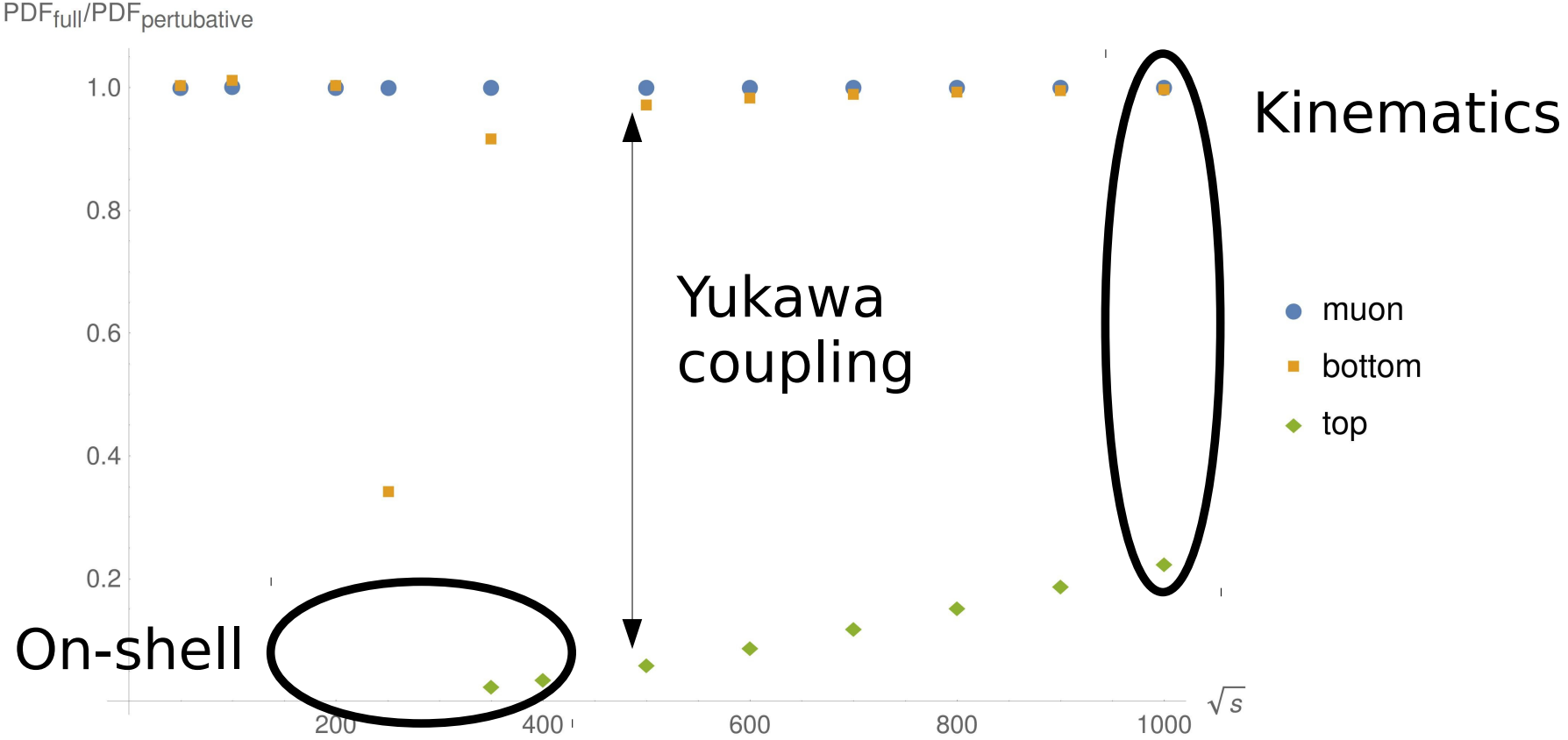

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- Implications for Technicolor [Maas'15]
  - No Brout-Englert-Higgs effect, no FMS
  - Gauge invariance must still be maintained
  - Lightest gauge-invariant state: Vectors?

Summary

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Egger, Maas, Sondenheimer'17]

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