# Two component Dark Matter

## with neutrino masses

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Focus on
arXiv:1811.11927 [PRD]
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# Preliminars

## Parameter space

$$S = \frac{1}{\sqrt{2}}\left(v_1 + h_1\right) + \frac{i}{\sqrt{2}} A_1$$

$$S' = \frac{1}{\sqrt{2}}\left(v_2 + h_2\right) + \frac{i}{\sqrt{2}} A_2$$

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$$G',\ A$$

$$\begin{pmatrix} H_1 \\ H_2 \end{pmatrix} = \begin{pmatrix} \cos\theta & -\sin\theta \\ \sin\theta & \cos\theta \end{pmatrix} \begin{pmatrix} h_1 \\ h_2 \end{pmatrix}$$

$$\tan\beta = \frac{v_2}{v_1}$$

$$M_{Z'}^2 = g_{BL}^2 v_2^2 \left(4 + \tan^2\beta\right)$$

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$$\mathcal{L} = {\color{green}M_1} \overline{\chi_1}\chi_1 + {\color{blue}M_2} \overline{\chi_2}\chi_2 + M_{N1}\overline{N_{R1}^c}N_{R1} + M_{N2}\overline{N_{R2}^c}N_{R2}$$

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11 parameters

$$M_{Z'}^2 = g_{BL}^2 v_2^2 \left(4 + \tan^2\beta\right)$$

$$m_\chi = M_1 \text{or } M_2$$

$$\mathcal{L} = M_1 \overline{\chi_1}\chi_1 + M_2 \overline{\chi_2}\chi_2 + M_{N1}\overline{N_{R1}^c}N_{R1} + M_{N2}\overline{N_{R2}^c}N_{R2}$$