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Generalized Supersymmetric Pati-Salam Models from Intersecting D6-branes

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We discuss the N = 1 supersymmetric

 $SU(12)_C \times SU(2)_L \times SU(2)_R$ models, $SU(4)_C \times SU(6)_L \times SU(2)_R$ models, and $SU(4)_C \times SU(2)_L \times SU(6)_R$ models from the Type IIA orientifolds on $T^6/(\mathbb{Z}_2 \times \mathbb{Z}_2)$ with intersecting D6-branes. These gauge symmetries can be broken down to the Pati-Salam gauge symmetry $SU(4)_C \times SU(2)_L \times SU(2)_R$ via three $SU(12)_C/SU(6)_L/SU(6)_R$ adjoint representation Higgs fields, and further down to the Standard Model (SM) via the D-brane splitting and Higgs mechanism. We obtain three families of the SM fermions, and have the left-handed three-family SM fermion unification in the $SU(4)_C \times SU(2)_L \times SU(2)_R$ models, and the right-handed three-family SM fermion unification in the $SU(4)_C \times SU(2)_L \times SU(2)_R$ models.

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