SEARCHES FOR FREE QUARKS, MONOPOLES, SUPERSYMMETRY, COMPOSITENESS, etc.

Free Quark Searches

All searches since 1977 have had negative results.

Magnetic Monopole Searches

Isolated candidate events have not been confirmed. Most experiments obtain negative results.

Supersymmetric Particle Searches

Limits are based on the Minimal Supersymmetric Standard Model.

Assumptions include: 1) $\widetilde{\chi}_1^0$ (or $\widetilde{\gamma}$) is lightest supersymmetric particle; 2) R-parity is conserved; 3) $m_{\widetilde{f}_L} = m_{\widetilde{f}_R}$, and all scalar quarks (except $\widetilde{t}_L$ and $\widetilde{t}_R$) are degenerate in mass.

See the Full Listings in the *Review of Particle Properties* (Physical Review **D50** 1173 (1994)) for a Note giving details of supersymmetry.

$\widetilde{\chi}_i^0$ — neutralinos (mixtures of $\widetilde{\gamma}$, $\widetilde{Z}^0$, and $\widetilde{H}_i^0$)

Mass $m_{\widetilde{\gamma}}$ > 15 GeV, CL = 90% [if $m_{\widetilde{f}} = 100$ GeV (from cosmology)]

Mass $m_{\widetilde{\chi}_1^0}$ > 18 GeV, CL = 90% [GUT relations assumed]

Mass $m_{\widetilde{\chi}_2^0}$ > 45 GeV, CL = 95% [GUT relations assumed]

Mass $m_{\widetilde{\chi}_3^0}$ > 70 GeV, CL = 95% [GUT relations assumed]

Mass $m_{\widetilde{\chi}_4^0}$ > 108 GeV, CL = 95% [GUT relations assumed]

$\widetilde{\chi}_i^{\pm}$ — charginos (mixtures of $\widetilde{W}^{\pm}$ and $\widetilde{H}_i^{\pm}$)

Mass $m_{\widetilde{\chi}_1^{\pm}}$ > 45 GeV, CL = 95% [all $m_{\widetilde{\chi}_1^0}$]

Mass $m_{\widetilde{\chi}_2^{\pm}}$ > 99 GeV, CL = 95% [GUT relations assumed]

$\widetilde{\nu}$ — scalar neutrino (sneutrino)

Mass $m >$ 37.1 GeV, CL = 95% [one flavor]

Mass $m >$ 41.8 GeV, CL = 95% [three degenerate flavors]