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Search for a scalar top quark using the OPAL detector

The OPAL Collaboration

Abstract

A search for a supersymmetric partner of the top quark ($\tilde{t}_1$) has been performed by the OPAL experiment in e^+e^- collisions at LEP. The integrated luminosity of the data sample analysed was 69.1 pb^{-1}, which corresponds to 1.68×10^6 produced $Z^0 \rightarrow q\bar{q}$ events. No $\tilde{t}_1$ candidates have been found. This study excludes the existence of the $\tilde{t}_1$ with a mass below 45.1 GeV at 95% C.L., where the mixing angle of left- and right-handed partners is smaller than 0.85 rad or greater than 1.15 rad, and the mass difference between the $\tilde{t}_1$ and the lightest neutralino is greater than 5 GeV.

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