

## Detecting Toppion via a Flavor-Changing Single Top Quark Production Process

WANG Xue-Lei,<sup>1,2</sup> XU Su-Jun,<sup>3</sup> LI Bing-Zhong,<sup>2</sup> YANG Yue-Ling,<sup>2</sup> and LU Gong-Ru<sup>1,2</sup>

<sup>1</sup> CCAST (World Laboratory), P.O. Box 8732, Beijing 100080, China

<sup>2</sup> College of Physics and Information Engineering, Henan Normal University, Xinxiang 453002, China

<sup>3</sup> Physics Department, Xinjiang University, Urumuqi 830046, China

(Received: 2002-4-3; Revised: )

**Abstract:** In the framework of topcolor-assisted technicolor (TC2) theory, we study a flavor changing single top quark production process  $p\bar{p}(pp) \rightarrow \Pi_t^0 \rightarrow t\bar{c}(\bar{t}c)$  at upgraded Tevatron and LHC. The results show that with the flavor changing coupling of neutral toppion to top and charm quark, toppion provides a large  $t\bar{c}$ -channel resonance effect. The signal of single top production could be detected at LHC. Otherwise, the narrow peak in the invariant mass distribution could be clearly detected both at upgraded Tevatron and LHC. Therefore, such single top production process provides a unique way to test TC2 model via the detection of  $t\bar{c}$ -channel neutral toppion contribution.

PACS: 14.65.Ha, 12.15.Lk, 12.60.Nz

**Key words:** topcolor-assisted technicolor model, toppion, electroweak symmetry breaking

[\[Full text: PDF\]](#)

Close