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TRACKING TRENDS & PERFORMANCE IN BASIC RESEARCH

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2009 : March 2009 - Fast Moving Fronts : Tao Han, Biswarup Mukhopadhyaya, Kai Wang & Zongguo Si

FAST MOVING FRONTS - 2009

March 2009



Tao Han, Biswarup Mukhopadhyaya, Kai Wang & Zongguo Si talk with ScienceWatch.com and answer a few questions about this month's Fast Moving Front in the field of Physics. The authors have also sent along images of their work.



Article: Pair production of doubly charged scalars: Neutrino mass constraints and signals at the CERN LHC

Authors: Han, T; Mukhopadhyaya, B; Si, ZG; Wang, K

Journal: PHYS REV D, 76 (7): art. no.-075013 OCT 2007

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SW: Why do you think your paper is highly cited?

It is because of the relevance of the work in connection to two quite important developments in the field of high energy physics, namely, the recent discovery of neutrino masses and the upcoming frontier experiments at the Large Hadron Collider (LHC) near Geneva, Switzerland.

SW: Does it describe a new discovery, methodology, or synthesis of knowledge?

Based on these recent discoveries with neutrinos, the work predicts potential discoveries, in the near future, from experiments conducted at the LHC.

SW: Would you summarize the significance of your paper in layman's terms?

The paper proposed a unique and clean signal to directly test a neutrino mass generation mechanism at the CERN Large Hadron Collider (LHC). The tiny mass of neutrinos possesses a deep puzzle regarding their origin. If the mass generation is due to one type of theory, called the "type-II seesaw mechanism," we then have the potential to test it and thus understand this mass generation during upcoming LHC experiments. This would revolutionize our understanding of mass generation for elementary particles.

SW: How did you become involved in this research and were any particular problems encountered along the way?



Coauthor
Biswarup
Mukhopadhyaya



Coauthor
Kai Wang

This idea has led to several follow-up publications of ours (see further related [works](#), ([see also](#)), as well as many by others. The ultimately important outcome is to put forth the idea to test experimentally at the LHC. If confirmed, it would open a new window for a mass generation mechanism.



Coauthor
Zongguo Si

SW: Where do you see your research leading in the future?

This idea has led to several follow-up publications of ours, as well as many by others. The ultimately important outcome is to put forth the idea to test experimentally at the LHC. If confirmed, it would open a new window for a mass generation mechanism.

SW: Do you foresee any social or political implications for your research?

We think that the implications would be mainly scientific. It is the experimental confirmation or falsification which will finally determine the impact of this research in the field of high energy physics and for science over all.

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KEYWORDS: DOUBLE-BETA DECAY; LEFT-RIGHT SYMMETRY; HIGGS TRIPLET; STANDARD-MODEL; BOSONS; SUPERCOLLIDERS; VIOLATION; BREAKING.

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