An End-to-End Test of the Sensitivity of IceCube to the Neutrino Burst from a Core-Collapse Supernova

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What is this contribution about?

- Supernova "data challenges" are being performed at IceCube.
- A simulated neutrino burst from a Galactic core collapse supernova (CCSN) is injected into IceCube data.
- We use this to fully exercise our supernova trigger system.

Why is it relevant / interesting?

- Galactic CCSNe are **extraordinarily rare**, once-in-a-lifetime events.
- It is crucial to practice our alert handling procedure via data challenges to identify technical problems before a true alert occurs.

What have we done?

- We have developed software to perform signal injection and have performed multiple open, offline data challenges.

What is the result?

- Tests have produced supernova signals that agree with our expectation.
- Tests also revealed low-level technical problems in the trigger escalation scheme that are being addressed.
- We will continue to use these tests to ensure IceCube is prepared to observe these extremely important and rare astrophysical events.

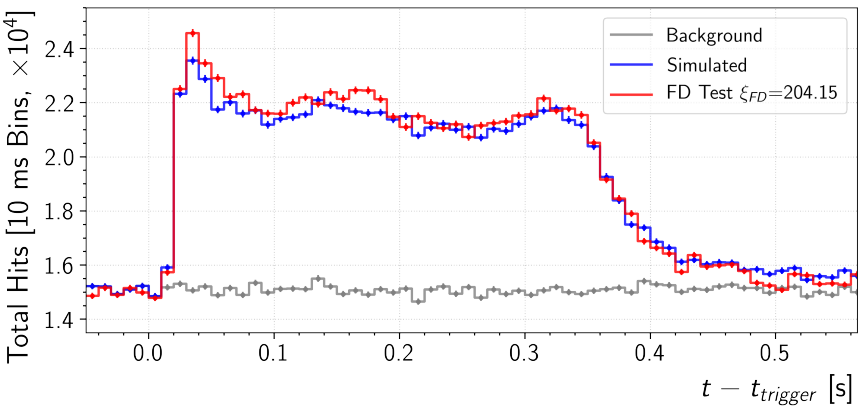

Figure 1: Comparison of a simulated neutrino lightcurve and the lightcurve reported during the "data challenge."