

Introduction, Previous and Current Work

Monopole Call 2020-04-02

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<https://github.com/fiedl/monopole-talk>
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Erlangen Centre for Astroparticle Physics

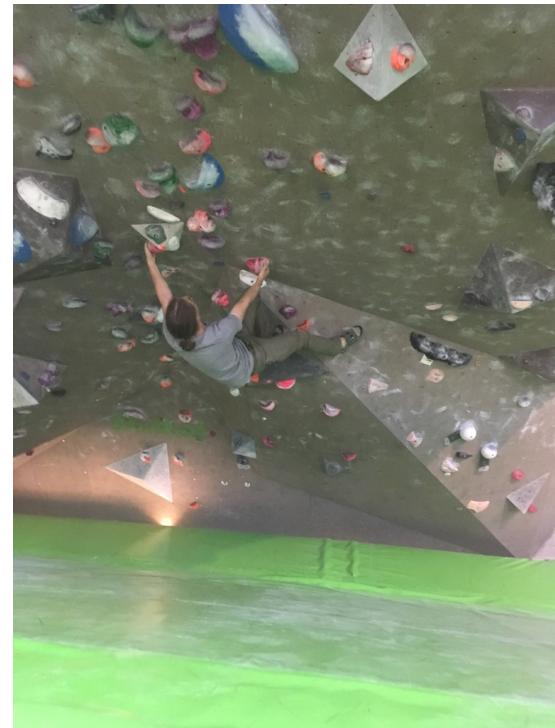
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Introduction: Who I am

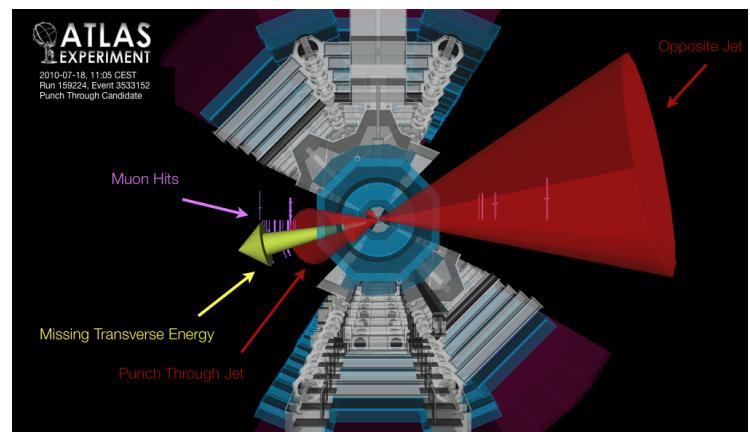
- Sebastian Fiedlschuster,
Erlangen Centre for Astroparticle Physics (ECAP),
Erwin-Rommel-Straße 1, 91058 Erlangen
- Email: sebastian.fiedlschuster@fau.de
- Slack: @fiedl
- Github: <https://github.com/fiedl>
- Status: PhD student at ECAP since March 2019
part-time IT freelancer
- Hobbies: Bouldering, playing piano



Work

- Event classification at ATLAS (CERN)
- Designer Metrics (GR) at DAMTP (UK)
- clsim & hole ice (master)
- School for Astroparticle Physics
- Neutrino-physics tutorial sessions
- monopole-generator review
- combo continuous integration
- git migration
- currently: clsim merge
- next: monopoles!

Punch-Through Detection for High-Energy Jets in ATLAS

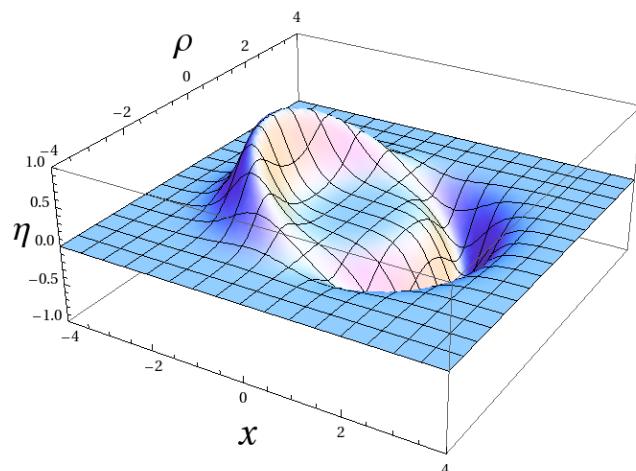


Punch-Through Events, containing high energy jets passing the calorimeter system without depositing their energy, resulting in a high missing transverse energy of more than 500 GeV, could amount to about 1-10 % of the events in data samples with MET cuts of 100 GeV in new-physics searches. One method of compensation is to filter out punch through events out of the data sample. To distinguish between punch through and non-punch through events, a selection algorithm was developed, which can be plugged into an existing framework.

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Alcubierre Warp Drive Theory



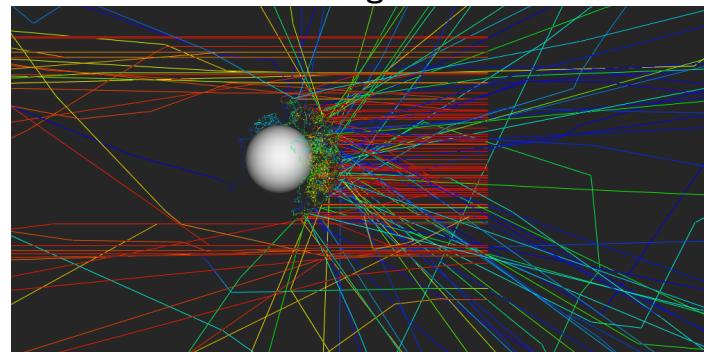
In this essay, the basic ideas behind a superluminal propulsion system, which is based on directed spacetime distortions are introduced. Using the 3+1 formalism, the Alcubierre metric tensor is derived, which satisfies the aspired properties of a warp drive. From an exemplary trip to alpha centauri, it becomes clear that the warp drive causes serious problems, which are discussed in the last part of the essay.

The figure shows the expansion η of volume elements associated with Euclidian observers against the coordinates x and ρ in 2D.

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The Effect of Hole Ice on the Propagation and Detection of Light in IceCube



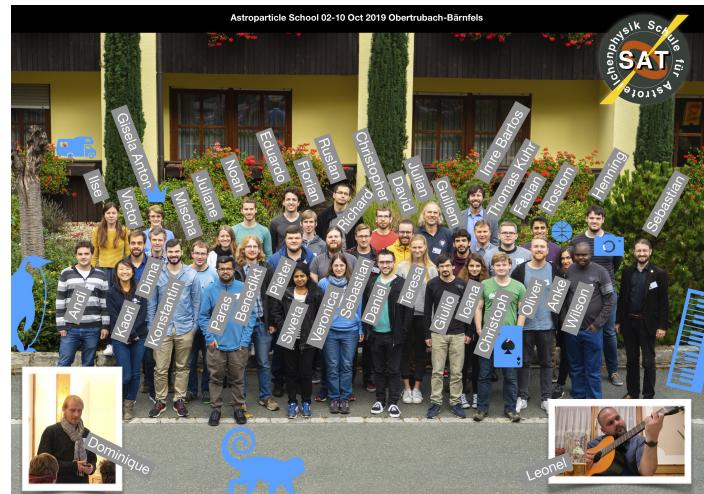
In distinction from the glacial bulk ice of the IceCube detector, hole ice is the refrozen water in the drill holes around the detector modules, and is expected to have different optical properties than the bulk ice. Aiming to improve detector precision, this study presents a new method to simulate the propagation of light through the hole ice, introducing several new calibration parameters. Evaluating calibration data indicates a strongly asymmetric shielding of the detector modules. A preliminary analysis suggests that this cannot be accounted for by the shadow of cables, but can be explained by hole ice with a suitable scattering length, size, and position relative to the detector modules.

<https://github.com/fiedl/hole-ice-study>

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School for Astroparticle Physics, Obertrubach



Astroparticle School 2019, Obertrubach

<https://astroteilchenschule.nat.fau.de>

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Neutrino Physics Tutorials



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monopole-generator review

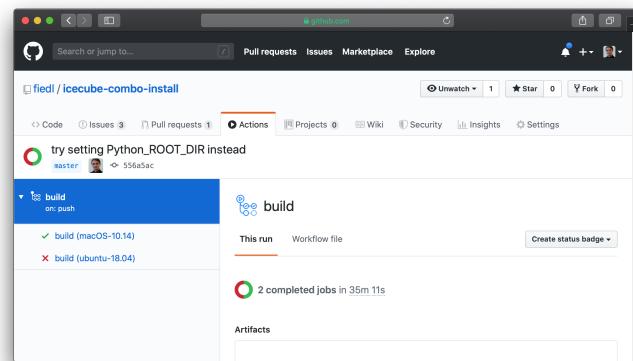
The screenshot shows a GitHub repository page for 'IceCube-SPNO / IceTrayCombo'. A pull request titled 'monopole-generator' is open, with 4 reviews, 0 stars, and 0 forks. The commit history shows several changes made by user 'olivas' to add the 'monopole-generator' module. The detailed description of the module states: 'The Monopole-Generator project provides two modules for IceCube simulations: The I3MonopoleGenerator generates randomly distributed magnetic-monopole particles. The I3MonopolePropagator then propagates those monopole particles. Along their trajectories, the propagator decreases their energy to account for ionization effects and creates secondary particles from interactions of the monopole particles with the surrounding medium.' Usage examples are provided in the code block.

<https://github.com/fiedl/monopole-generator/issues/1>
https://github.com/IceCube-SPNO/IceTrayCombo/blob/master/monopole-generator/resources/docs/2020-02-29_code_review.pdf

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IceCube Software Continuous Integration

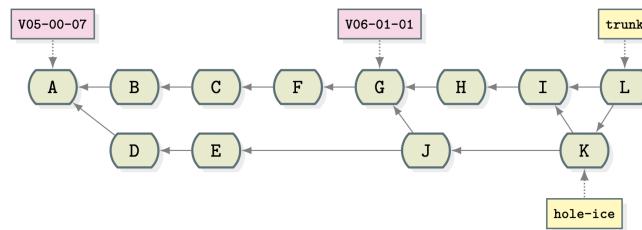


<https://github.com/fiedl/icecube-combo-install>

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IceCube Git Migration

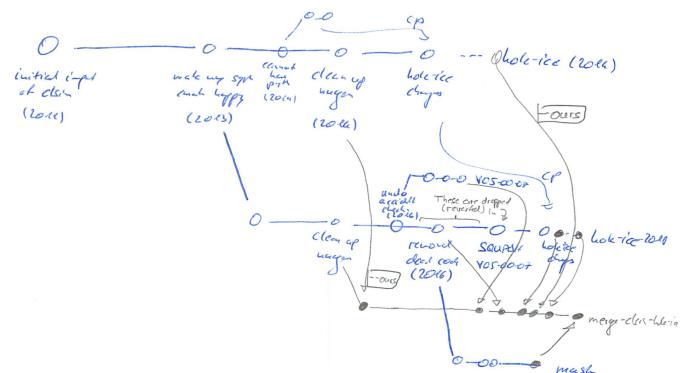


<https://github.com/fiedl/icecube-git-migration>

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Bring hole ice to main cslim



<https://github.com/fiedl/icecube-git-migration/issues/14>

<https://github.com/fiedl/cslim>

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Thanks for your attention!

Any input you might have is welcome:

<https://github.com/fiedl/icecube-combo-install/issues>

<https://github.com/fiedl/icecube-git-migration/issues>

<https://github.com/fiedl/monopole-generator/issues>

<https://github.com/fiedl/hole-ice-study/issues>

<https://github.com/fiedl/clsim/issues>

`sebastian.fiedlschuster@fau.de`

Slack: @fiedl

This talk's L^AT_EX: <https://github.com/fiedl/monopole-talk/releases>