

CHASM (CHerenkov Air Shower Model): Simulating the Cherenkov Profiles of Cosmic Ray Air Showers

Isaac Buckland* and Douglas Bergman on behalf of the Telescope Array Collaboration[†]

^aUniversity of Utah,
201 Presidents' Cir, Salt Lake City, USA

E-mail: ikepc1@gmail.com, bergman@physics.utah.edu

Reconstruction of an EAS seen using non-imaging Cherenkov detectors requires simulating the Cherenkov yield of many EAS's with given shower parameters. Since Shower Universality parameterizes both the angular distribution and energy distribution of charged particles within a shower, one can calculate the Cherenkov photon yield (at a fixed point) from the Cherenkov cones of electrons. In this work, we compare both the CWLD (Cherenkov Width Lateral Distribution) and arrival time distributions from Cherenkov universality calculations with those from CORSIKA iact (imaging atmospheric Cherenkov telescope) simulations. Since universality calculations are much less computationally expensive than shower simulation programs like CORSIKA, reconstruction could be accomplished more efficiently using Cherenkov data.

37th International Cosmic Ray Conference (ICRC 2021)
July 12th – 23rd, 2021
Online – Berlin, Germany

*Presenter

[†]A complete list of collaborators see Pos(ICRC2021)