



Sounding Rocket Mission Fact Sheet

Mission: Black and Diffuse Aurora Science Surveyor (BaDASS)
 Mission Number(s): 36.390 GE
 Principal Investigator: Dr. Samara/NASA Goddard Space Flight Center
 Launch Date: January 21, 2025
 Launch site: Poker Flat Research Range, AK



Description

BaDASS is designed to explore the processes responsible for creating the optical variations observable within the diffuse aurora and will specifically target the black aurora (BA).

Science questions:

1. What are the differences in the precipitating electron spectra (energy, flux, pitch-angle and temporal characteristics) inside and outside regions of black aurora?
2. What are the most likely physical processes responsible for generating the optical features?

A diffuse aurora is a type of aurora that appears as a faint, even glow across the sky with indistinct edges. It's caused by electrons from the Earth's magnetosphere being scattered into the upper atmosphere by atmospheric waves, such as electron cyclotron harmonic and upper-band chorus waves. Diffuse auroras are usually not visible to the naked eye because they are so spread out and faint. They occur during the growth phase of a geomagnetic substorm, when the aurora fades in slowly as a pink or red band.

Black auroras are small-scale features embedded in the diffuse background aurora, typically occurring post-substorm after magnetic midnight and with an eastward drift imposed. Black auroras show a significant reduction in optical brightness compared to the surrounding diffuse aurora, and can appear as slow-moving arcs or rapidly-moving patches and arc segments.*

APOGEE 298.8 SEC AT 330.6 KM

