

# Welcome!

## 2022 Singapore Short Course on GNSS Interferometric Reflectometry (GNSS-IR)



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# Class Goals

- Understand why and how well GNSS-IR works
- Learn how to use the *gnssrefl* software
- Learn what makes an optimal GNSS-IR site.

# Before the class starts

- I'll show you where gnsrefl code "lives"
- I'll install the code in two different ways (python via github and via a docker).
- I'll quickly demonstrate how you can make sure you have installed it correctly.

# If you have some time before the class

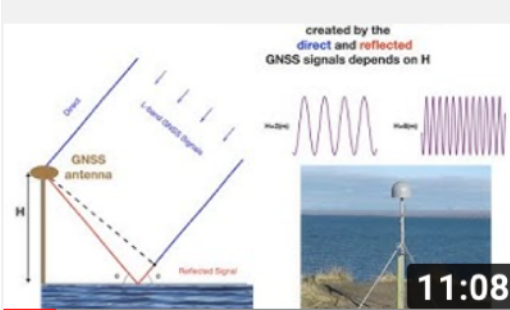


GNSS Interferometric Reflectometry (GNSS-IR)

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15:30

**GNSS-IR: An overview**



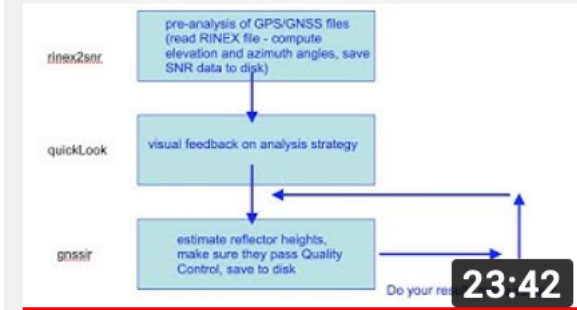
created by the direct and reflected GNSS signals depends on H

GNSS antenna

Reflected Signal

11:08

**GNSS-IR: How to estimate reflector height**



rinex2snr: pre-analysis of GPS/GNSS files (read RINEX file - compute elevation and azimuth angles, save SNR data to disk)

quickLook: visual feedback on analysis strategy

gnsrif: estimate reflector heights, make sure they pass Quality Control, save to disk

Do your re...

23:42

**GNSS-IR: how to run the gnsrif software.**

<https://www.youtube.com/channel/UCC1NW5oS7liG7C8NBK148Bg>

# python install

- git clone gnsrefl (copy the source code to your local machine)
- set your environment variables (linux)
- set up a python virtual environment & activate it
- install the code (pip install .)
- install RINEX executables (installexe)
- run a test case (station p038, 2022, 150)

# docker install

- install docker
- install the gnsrefl docker image
- run a test case (station p038, 2022, 150)

This looks easier .... but you do pay a price!