

## Low frequency component (LF)

## high frequency component (HF)

C-LSAT2.0

25°x25° spatial running average

Calculating annual temperature

15 year median filter

C-LSAT2.0 - LF

ERA5 reanalysis dataset

Distinguish the ERA5 land area

Training EOTs modes

localizing EOTs modes

Whether all EOTs modes can be overlaid to cover global land?

yes

no

no

yes

Calculating the fitting coefficient using LU decomposition

Reconstructing HF using the fitting coefficient and EOTs modes

Filling missing grids

15° × 25° spatial running average, in latitude and longitude respectively

9 point binomial filter in space

3-point binomial filter in time

Are there missing grids?

no

15° × 25° spatial running average, in latitude and longitude respectively

yes

Observation constraint

Reconstructed LSAT

