

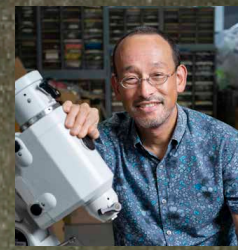
# One page executive summary

## Introduction



### The status of the TALE surface detector array and TALE infill project

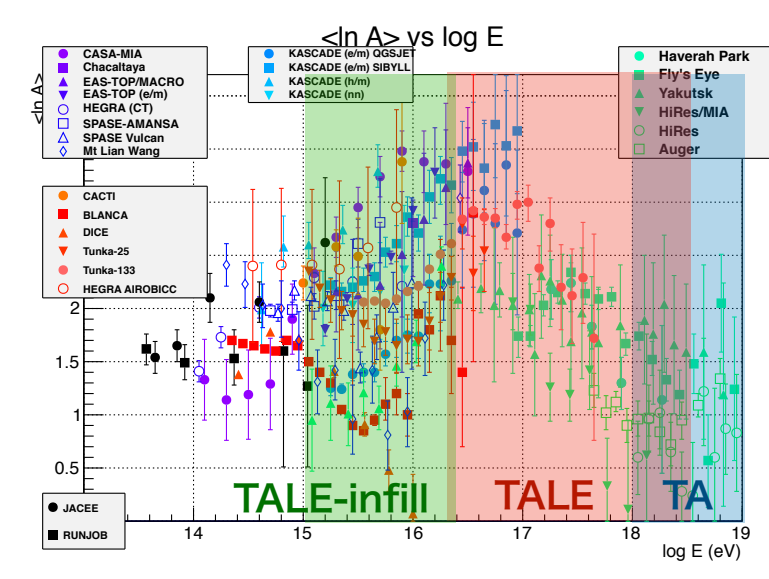
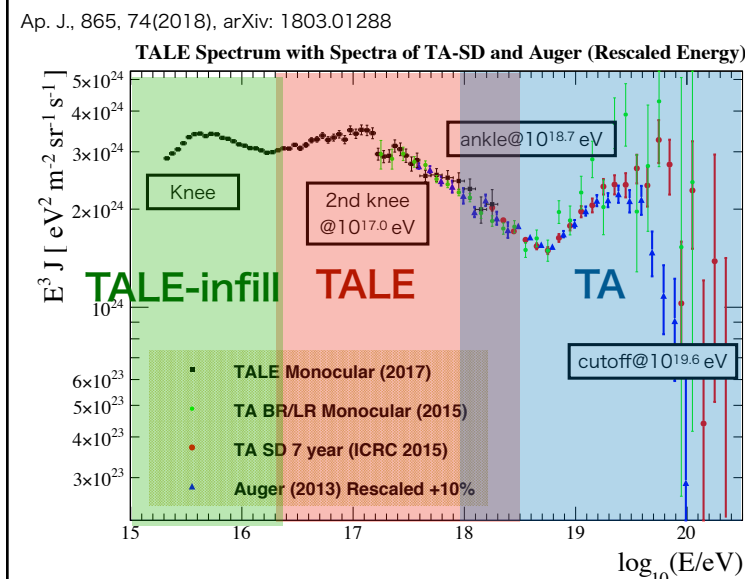
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#### Summary

- TALE and TALE infill: covering with FD+SD over “knee” to “ankle”
- Routine operation of TALE hybrid for more than 2 years
- 54 SDs will be additionally installed in the TALE site in 2022

## Extension of TALE: TALE-infill



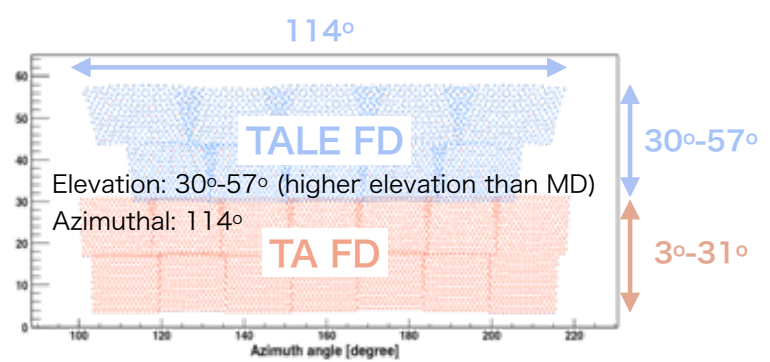
TALE + TALE-infill “hybrid” covering “knee” to “ankle”:

- \*Detailed studies of spectrum and composition
  - <= Hybrid observation with FDs plus SDs
- \*Anisotropy study
  - <= Uniform + high statistics with SD array

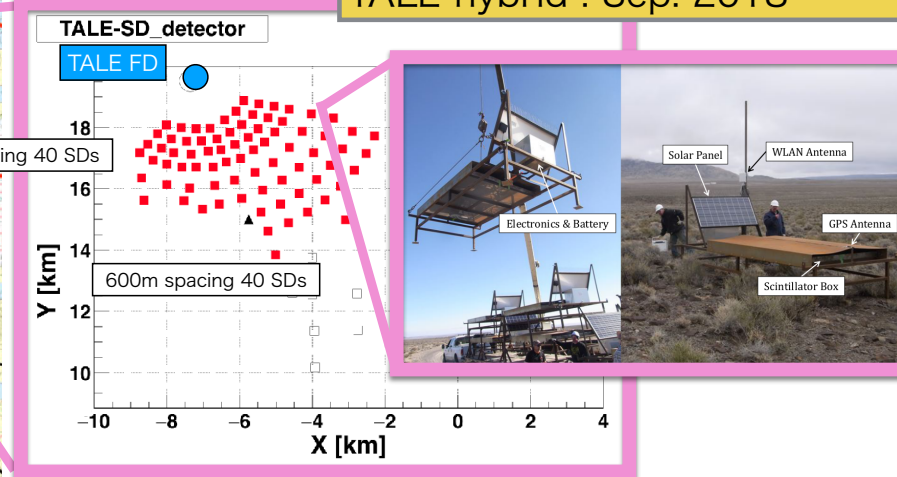
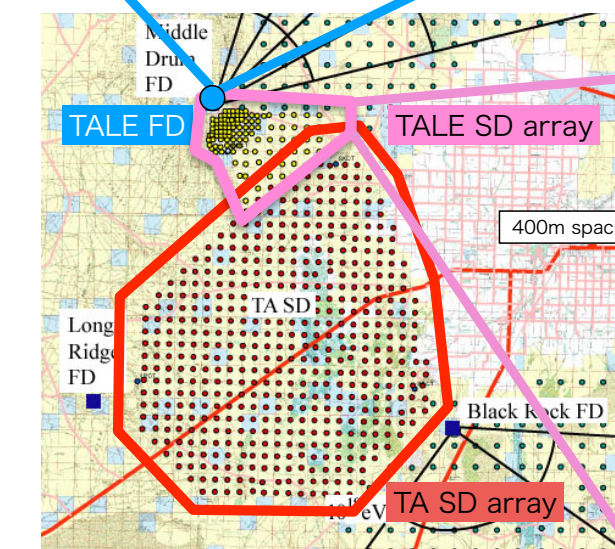
## TALE hybrid

### TALE hybrid

10 FDs + 80 SDs in TA site



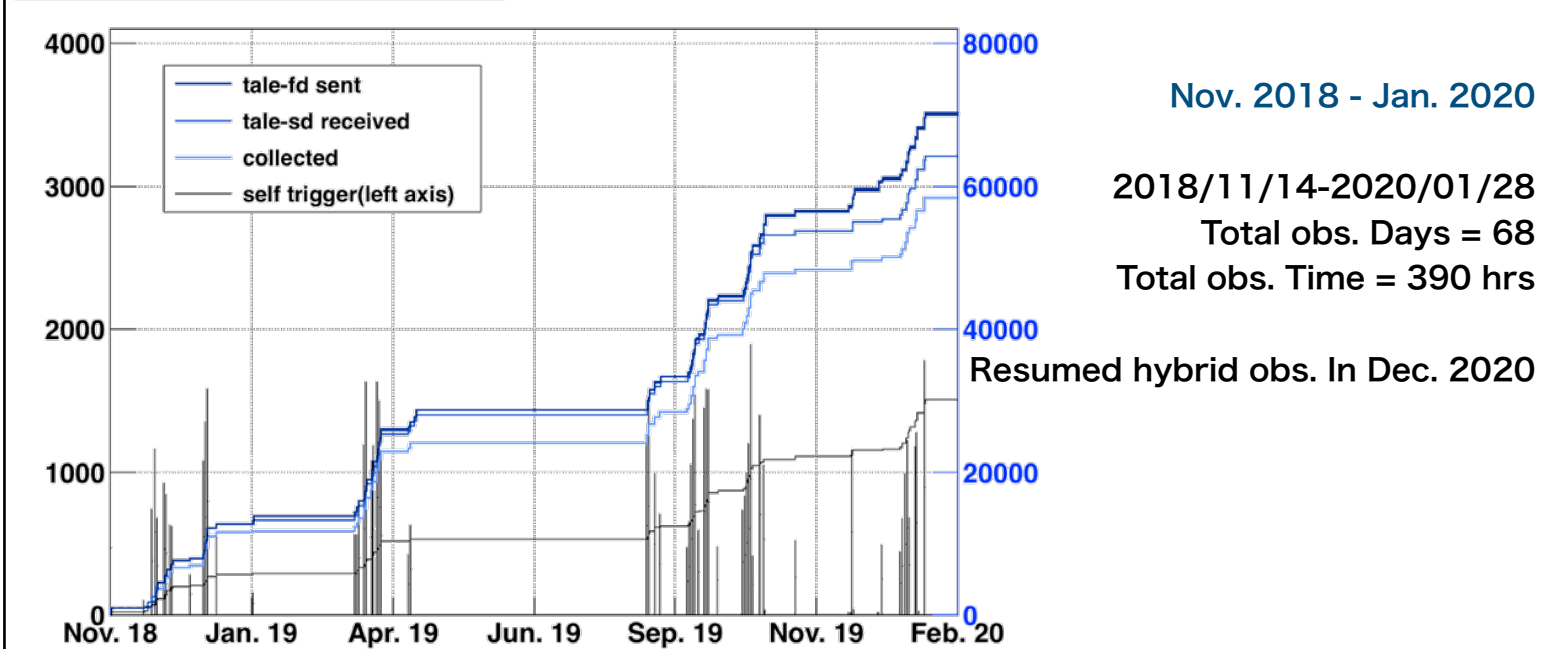
TALE-FD : Sep. 2013 ~  
TALE-SD array : Feb. 2018 ~  
TALE-hybrid : Sep. 2018 ~



## TALE hybrid operation status

80 SDs covering about 20 km<sup>2</sup>  
Routine operation from Oct. 2018  
Triggering condition:  
SDs of > 0.3 MIPs within +/- 32us of TALE FD trigger

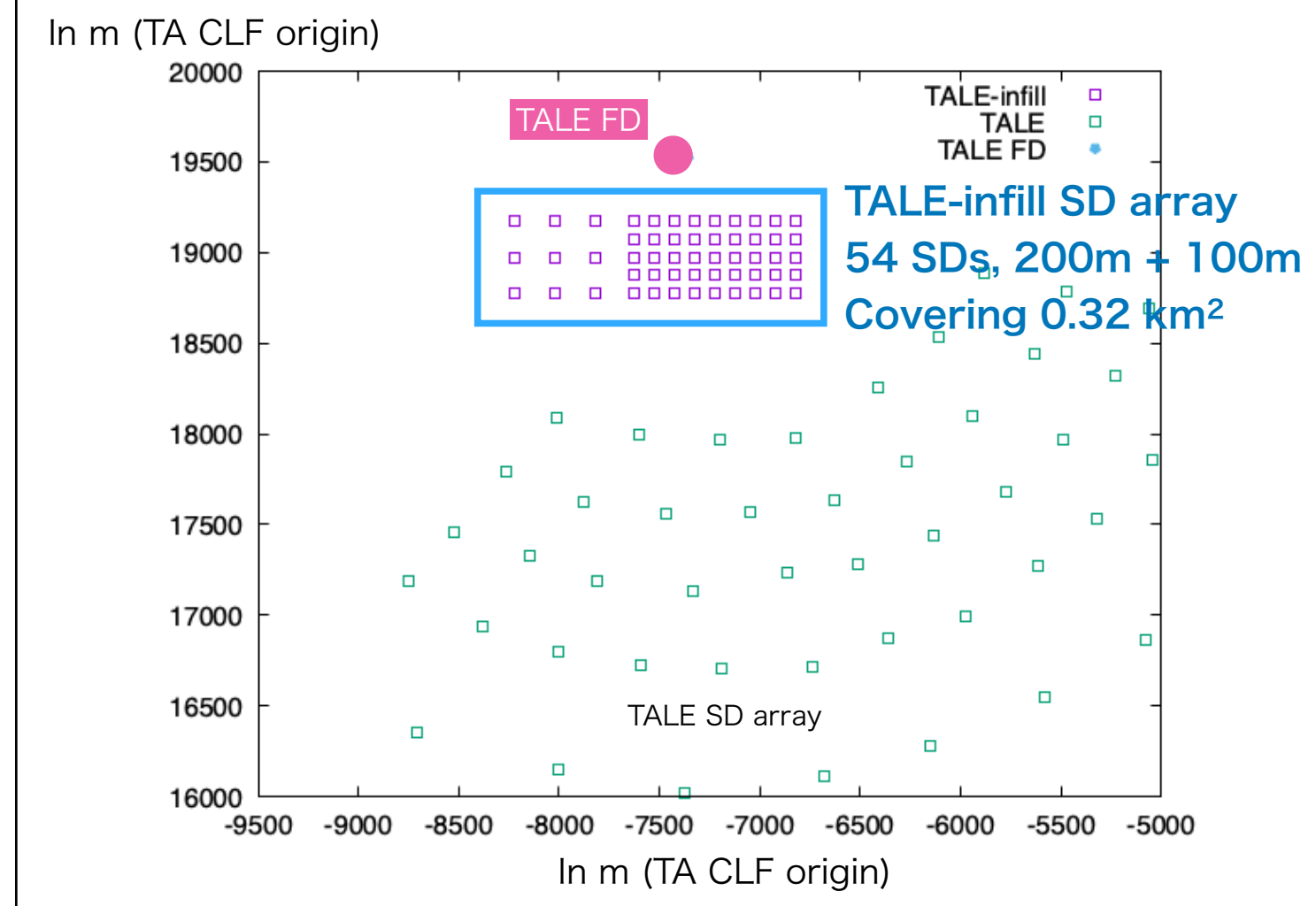
tale hybrid trigger events plot



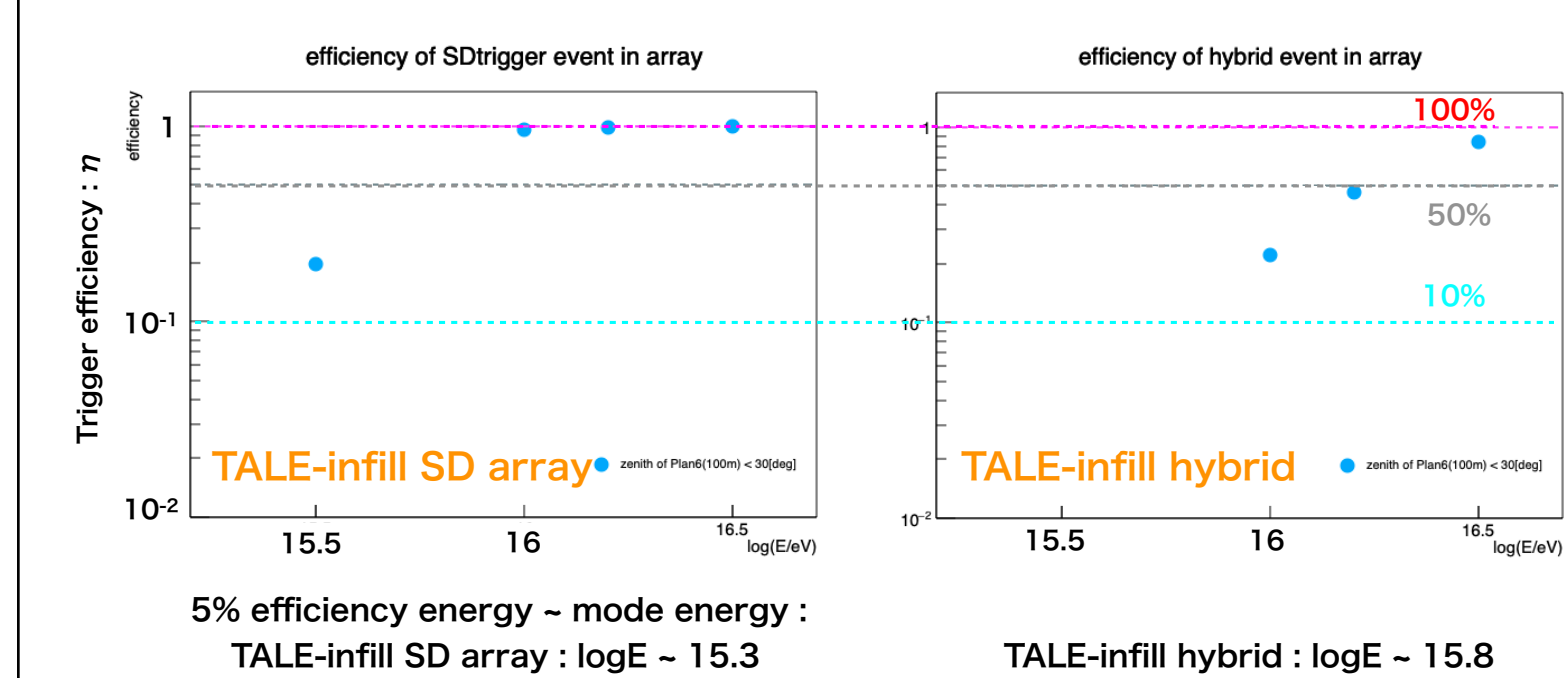
Nov. 2018 - Jan. 2020  
2018/11/14-2020/01/28  
Total obs. Days = 68  
Total obs. Time = 390 hrs  
Resumed hybrid obs. In Dec. 2020

## TALE-infill project

### Extension of TALE: TALE-infill



## Triggering efficiency of TALE-infill hybrid



5% efficiency energy ~ mode energy :  
TALE-infill SD array : logE ~ 15.3  
TALE-infill hybrid : logE ~ 15.8