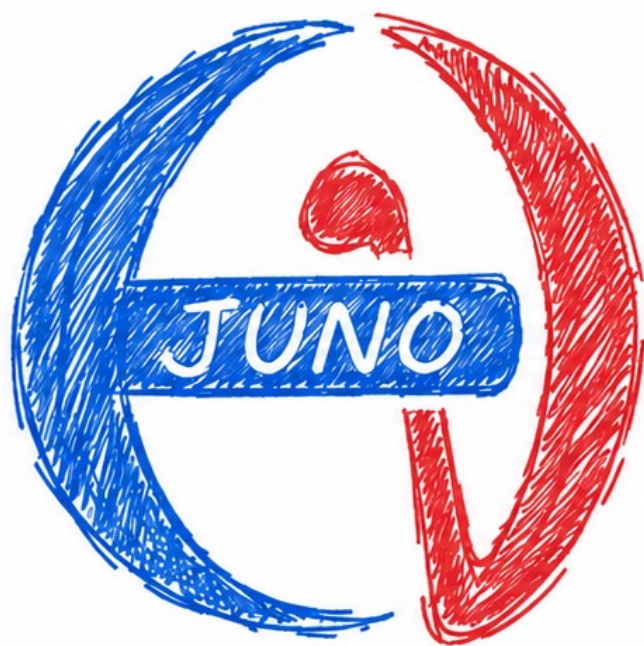




Application of the Dr. Sai Agentic Scientific Workflow in JUNO



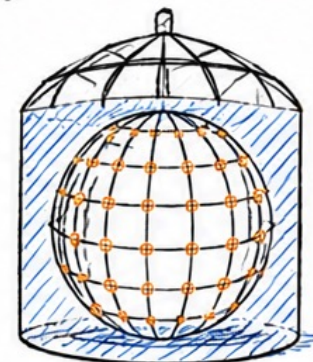
2026 June 19
11:40



Neutrino Physics and
Machine Learning 2026
@ UC Irvine

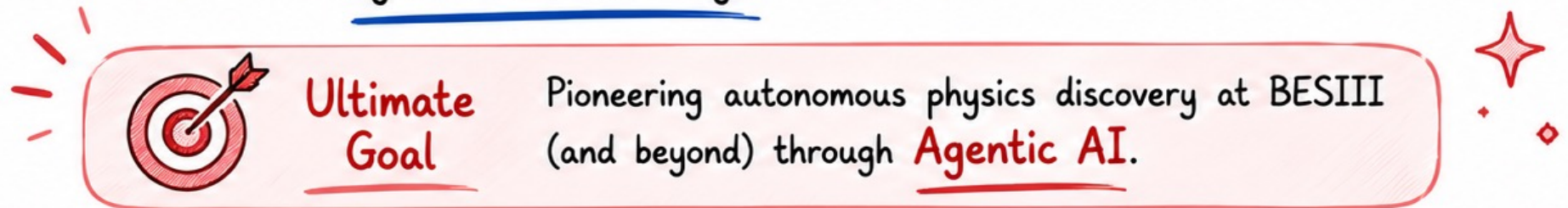
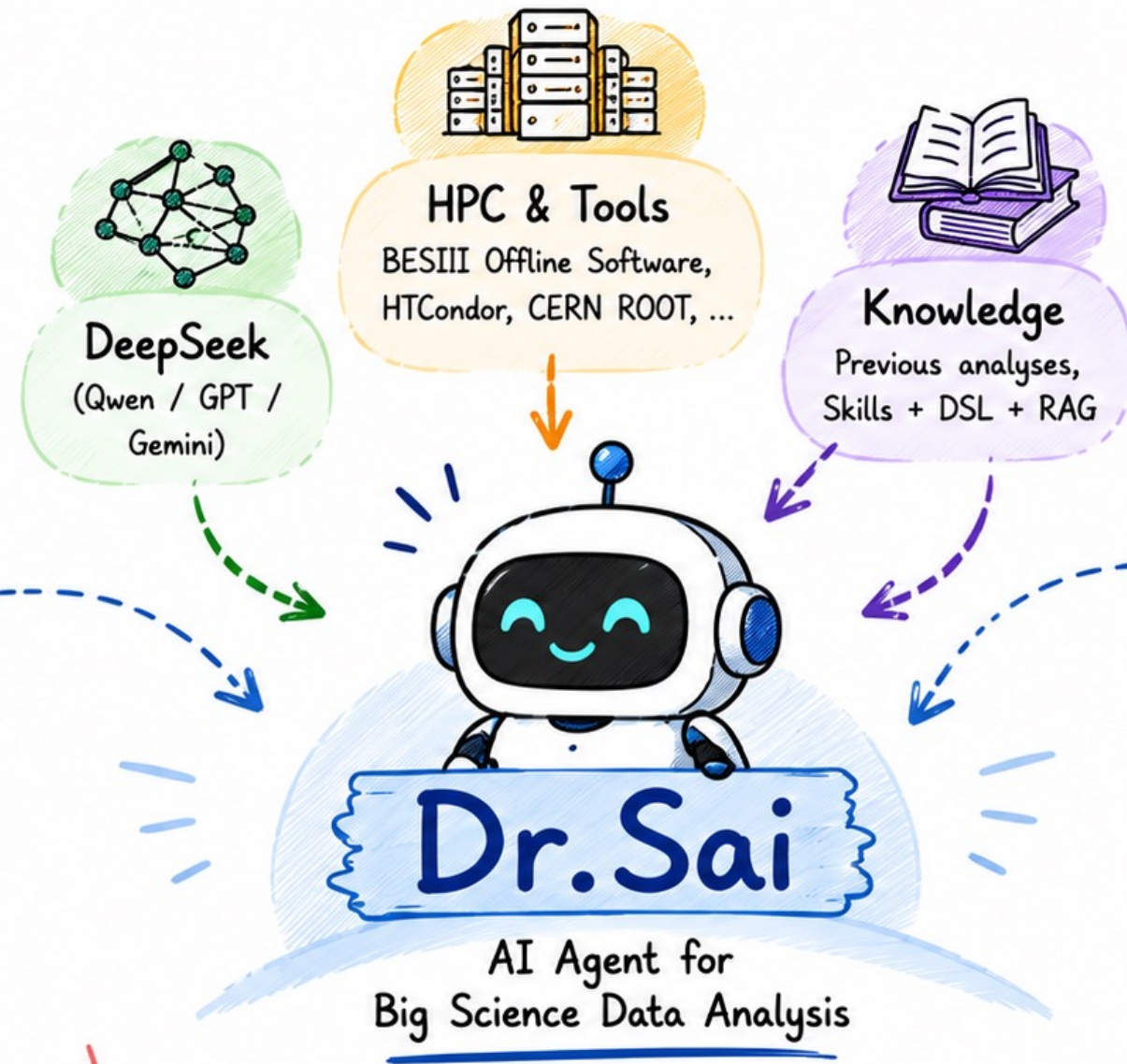
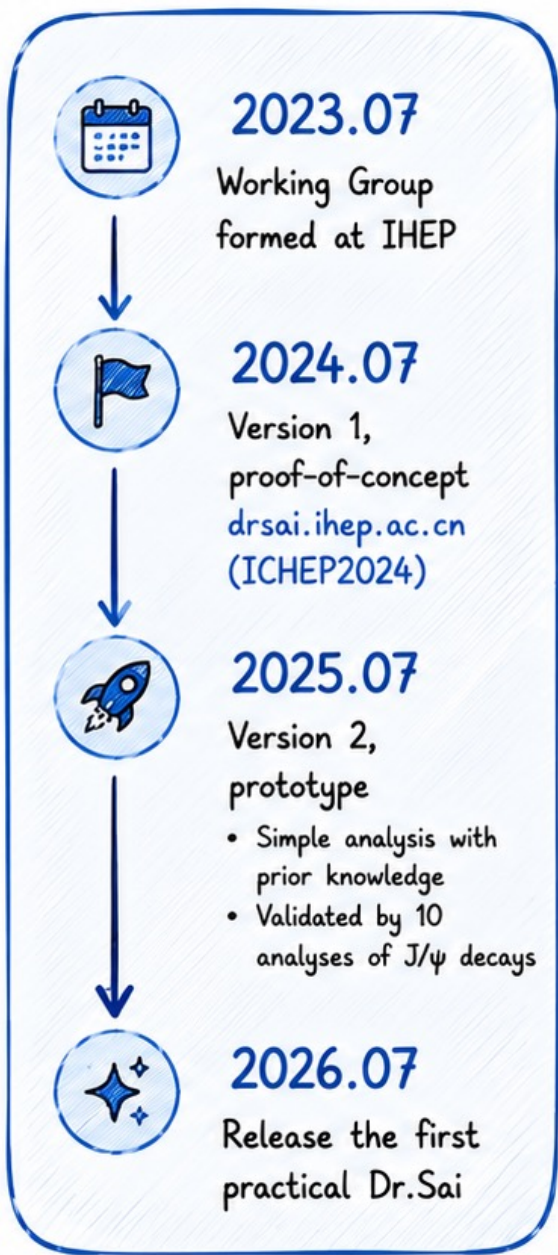


speaker:
Dr. Xuefeng DING



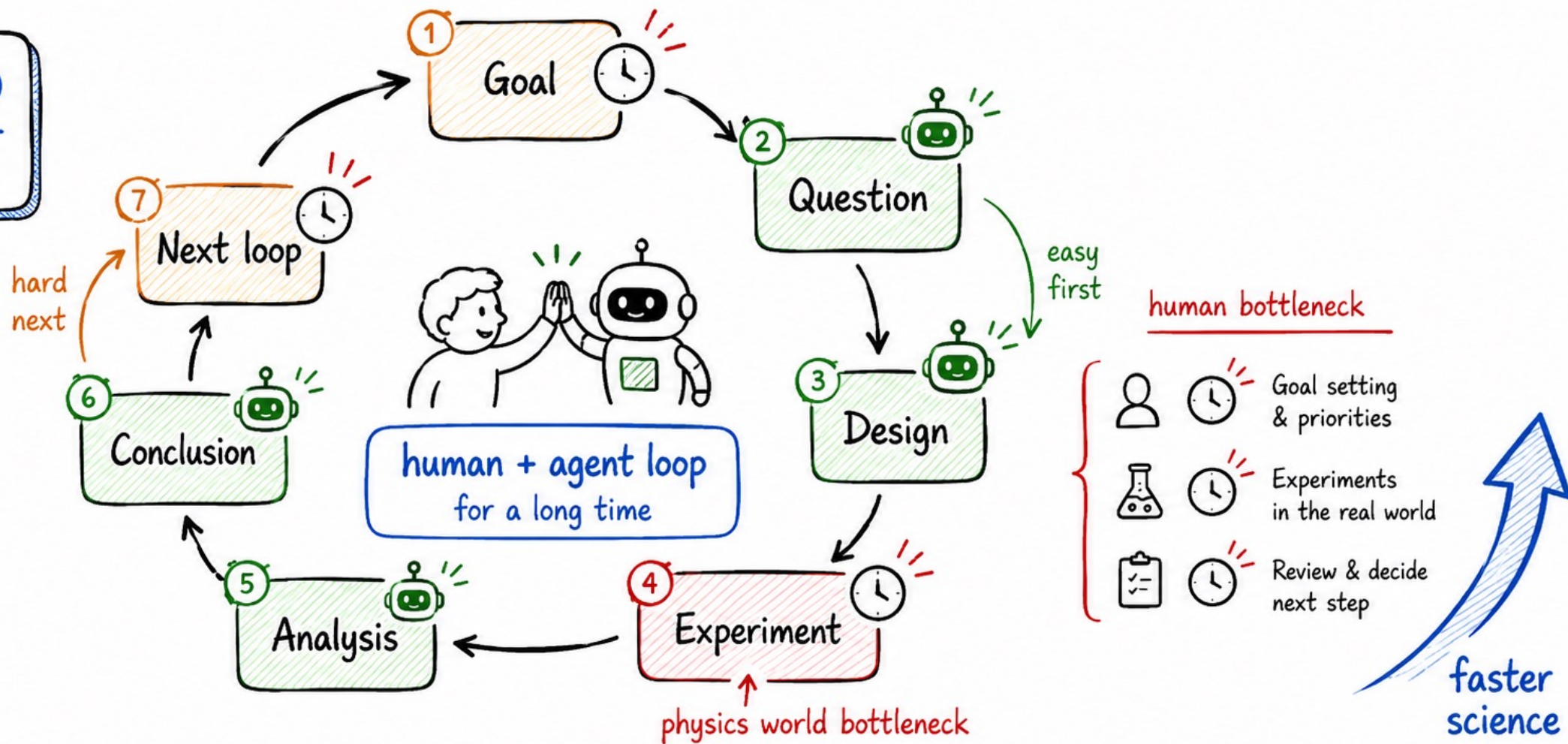
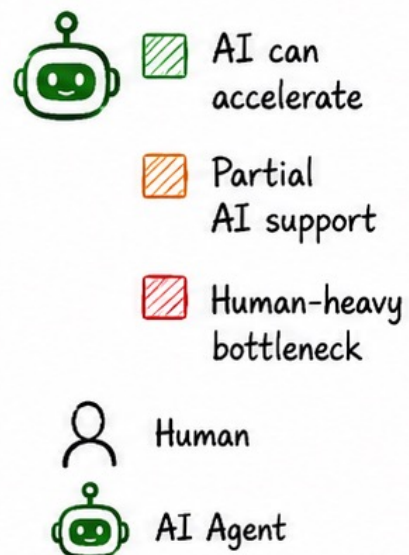
Xuefeng Ding (IHEP) @ UCI(online) 2026.06.18



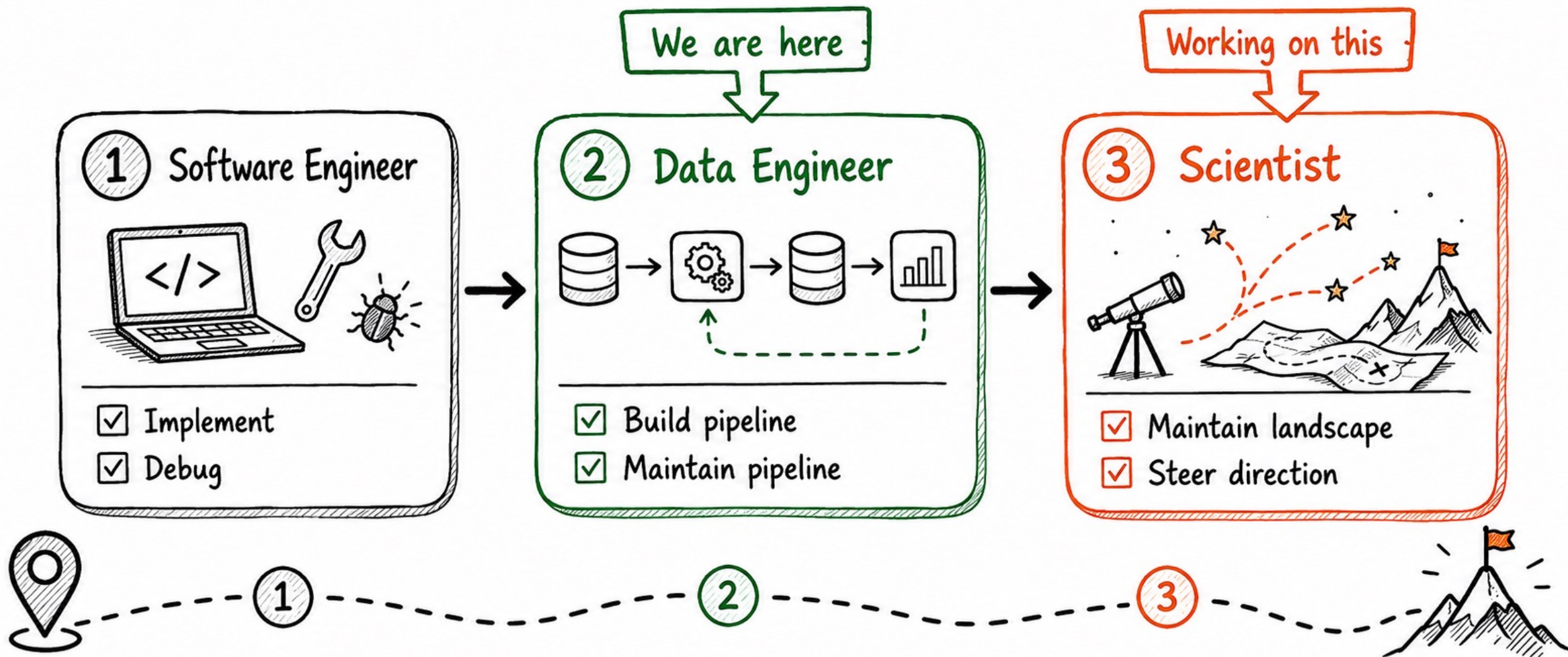


Dr.Sai JUNO

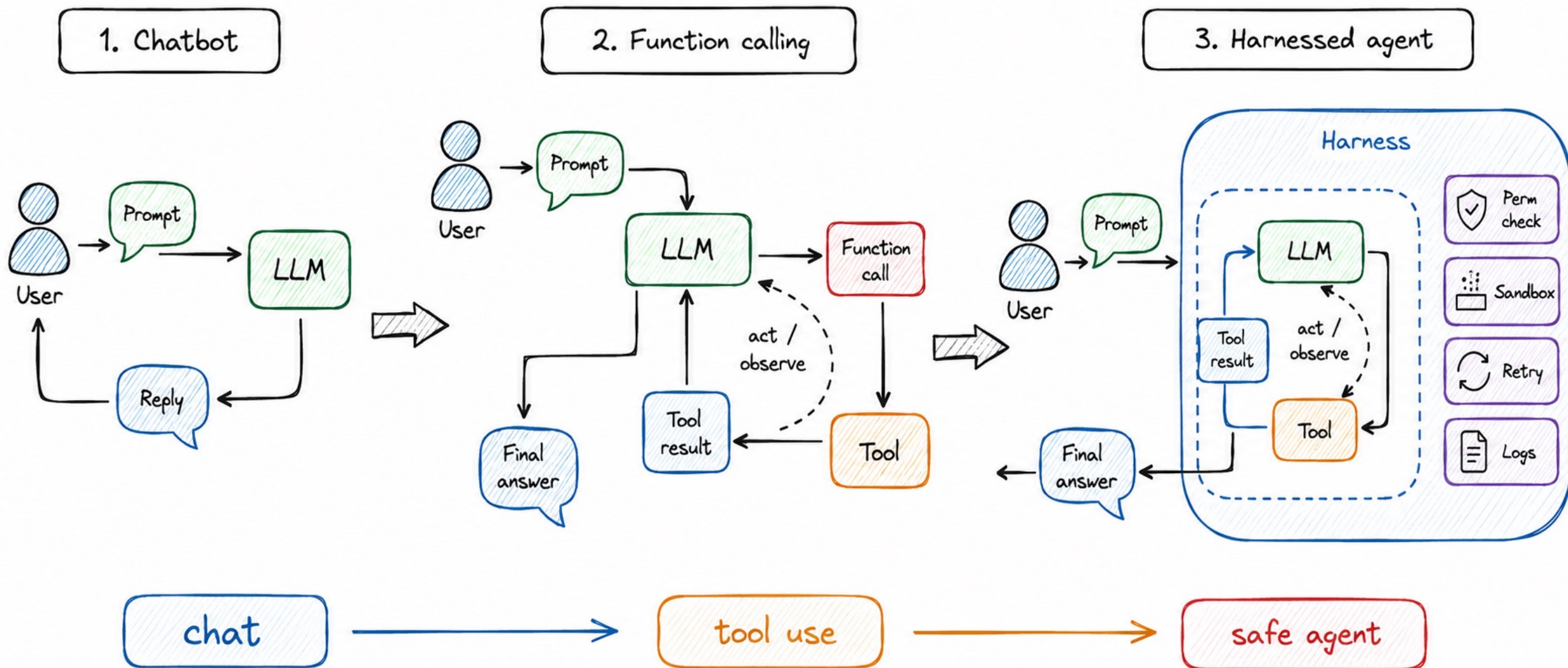
AI-human co-work



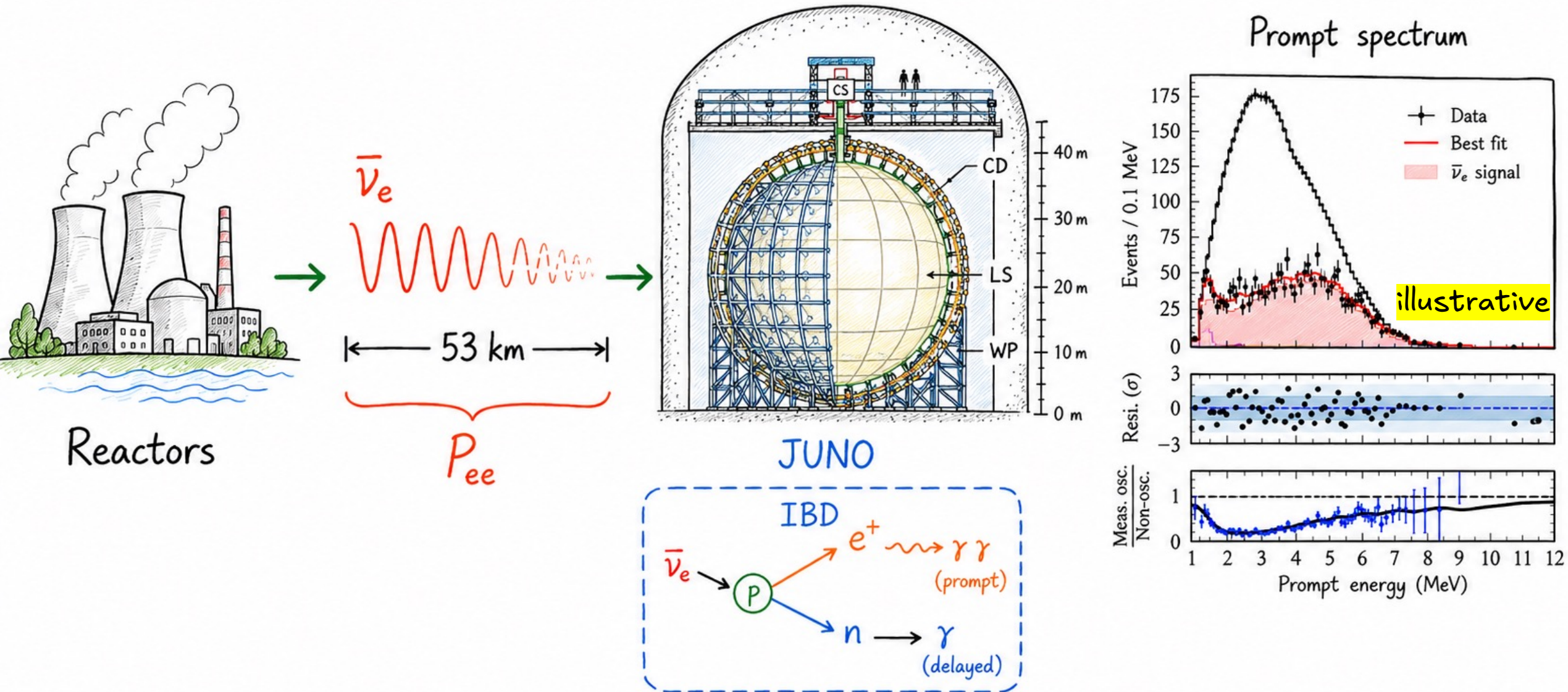
AI Roadmap in the Dr. Sai JUNO Project



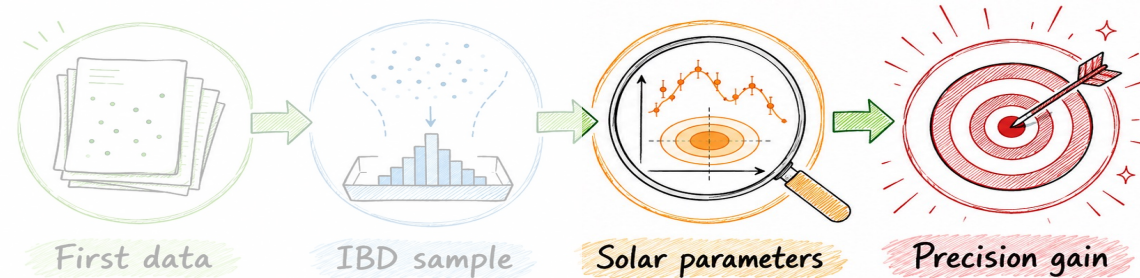
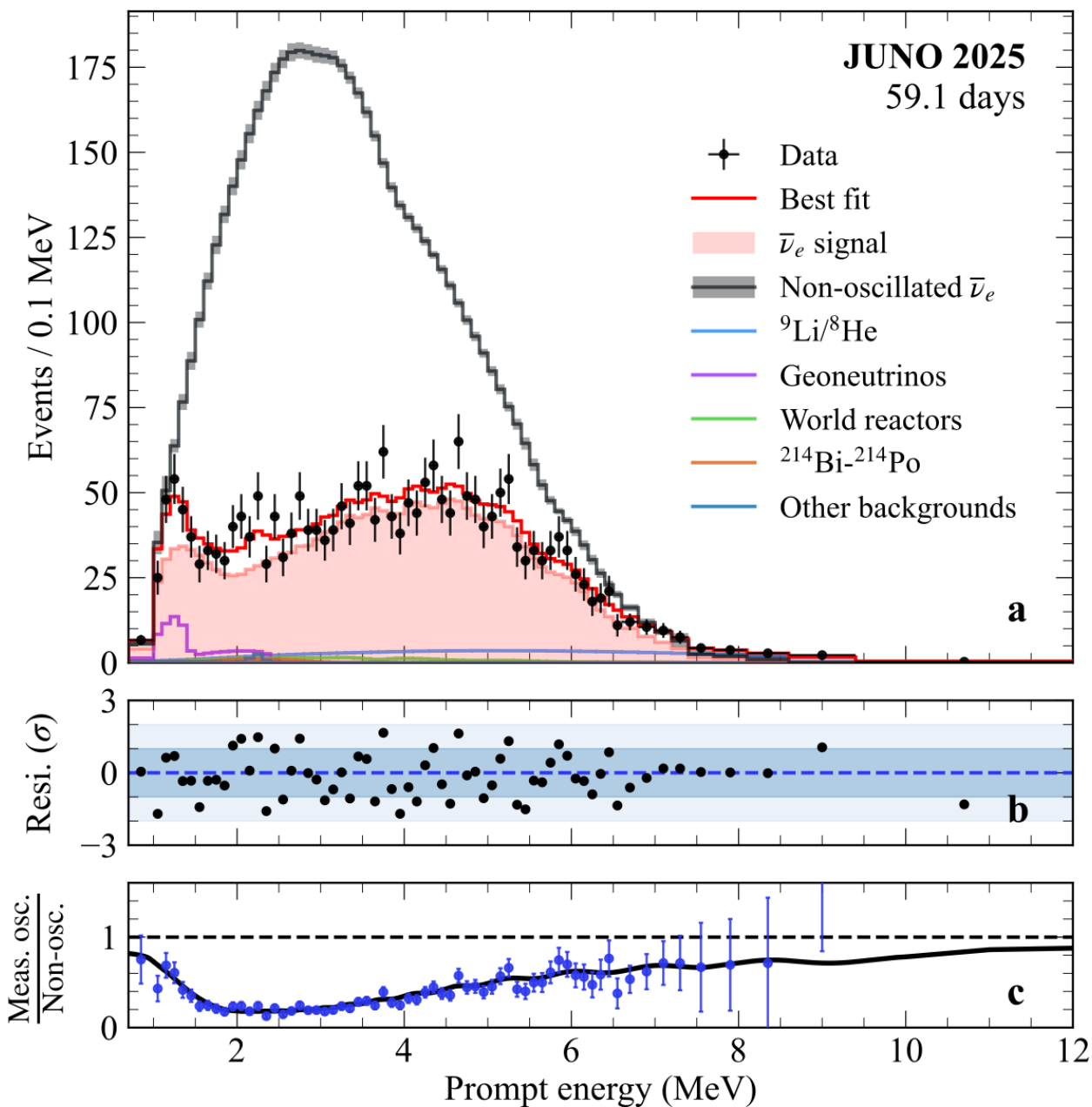
What are agents



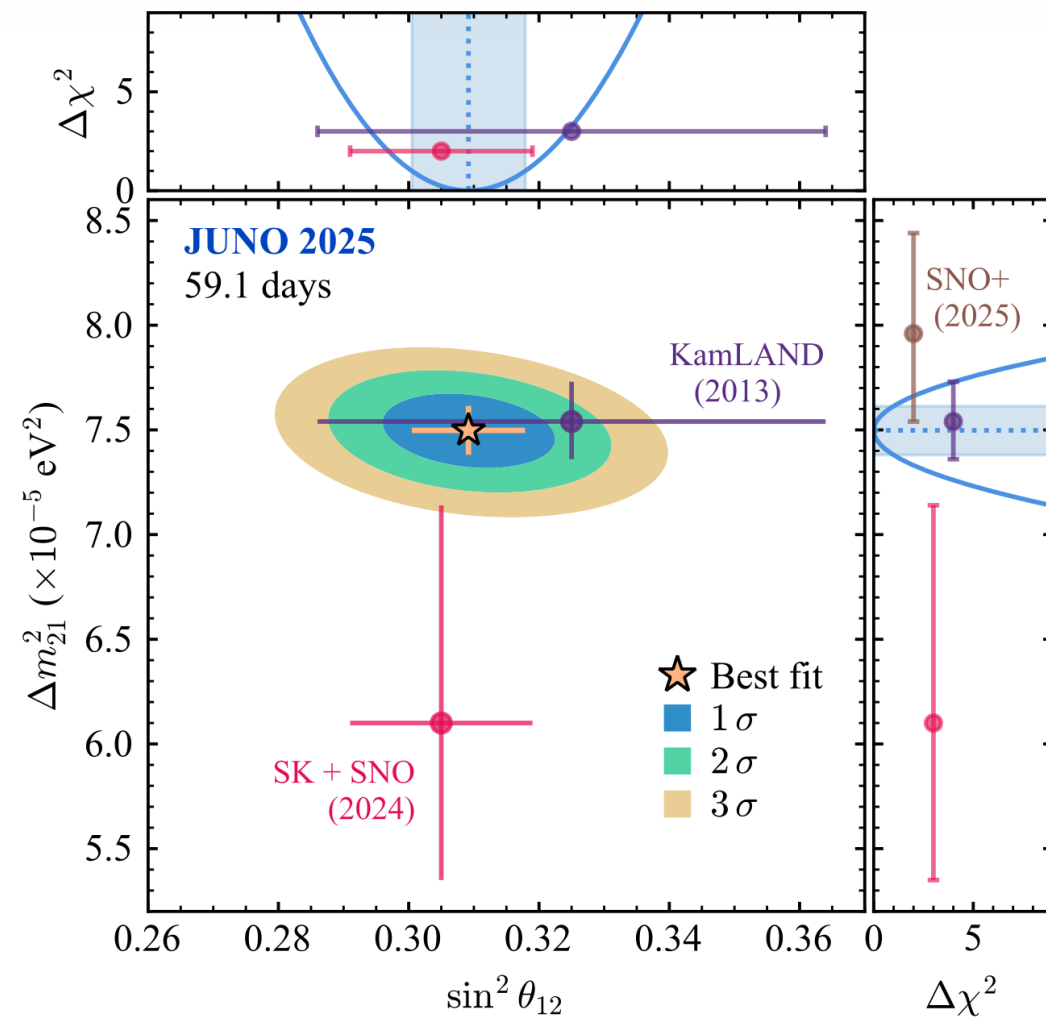
Very brief story of JUNO



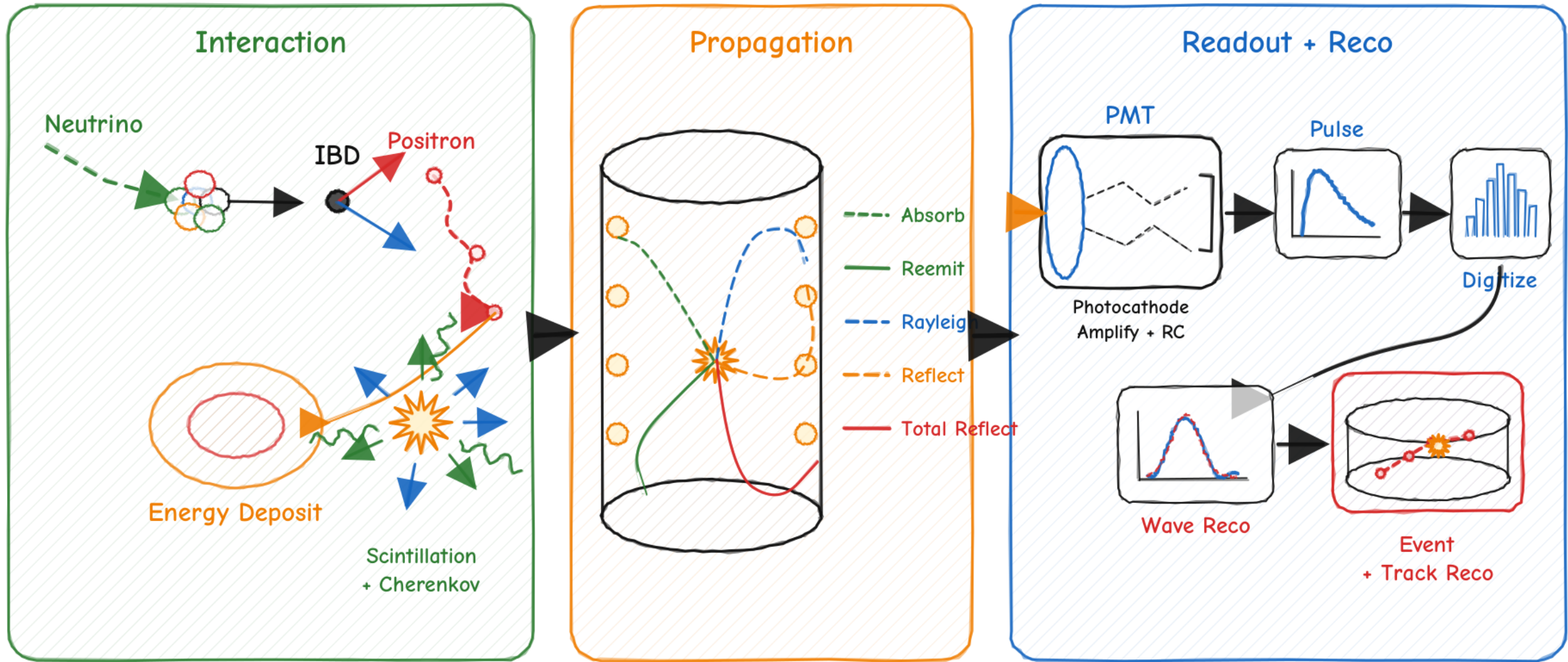
Energy spectrum of prompt IBD candidates



Results on solar oscillation parameters



JUNO as a LS detector

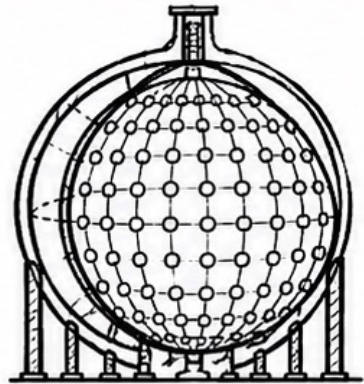


OMILREC

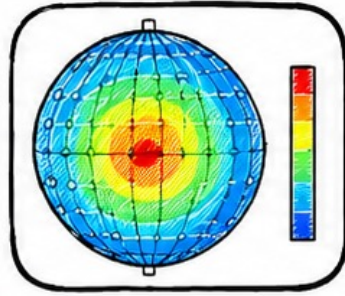
Gold-standard reconstruction

✓ Data-driven

✓ Best accuracy

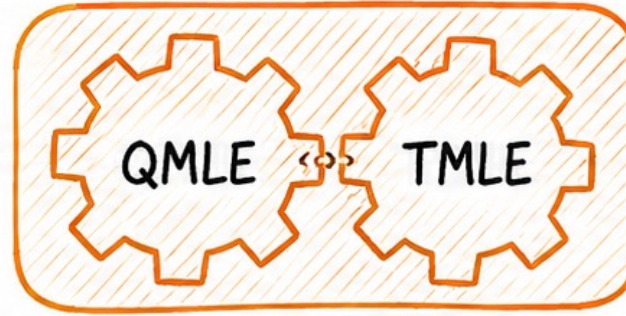


Calibration data



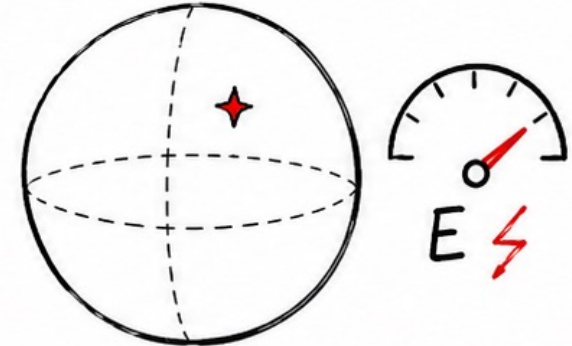
Response maps

Likelihood reco

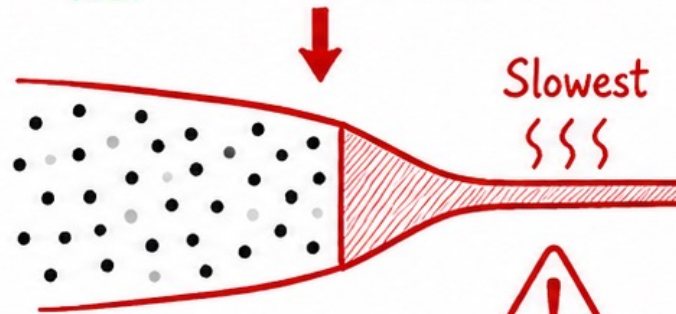


Reference method

Point-like
reco



Vertex + Energy



Slowest
SSS

Many events
(10^{10} – 10^{11})

million CPU-days

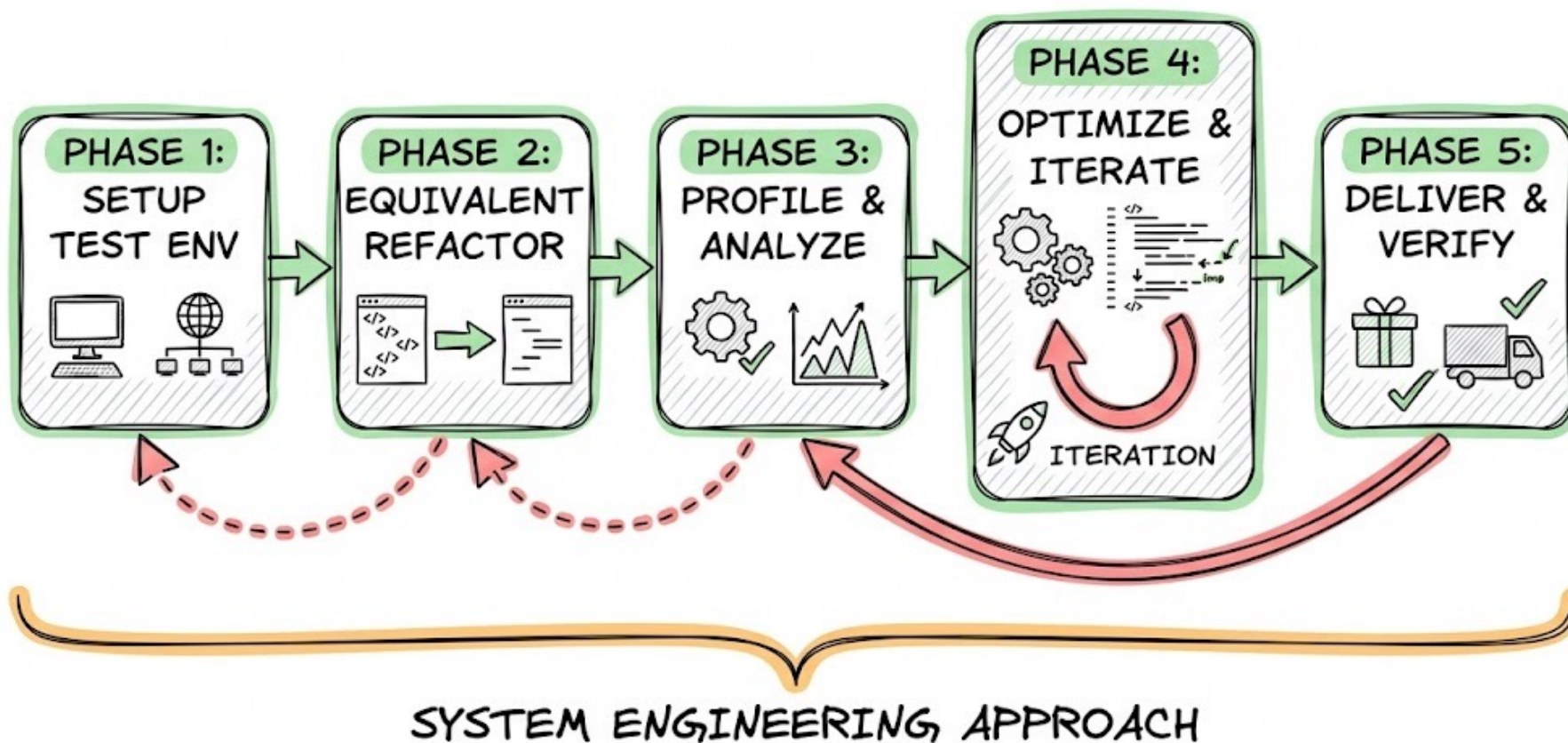


Need speedup

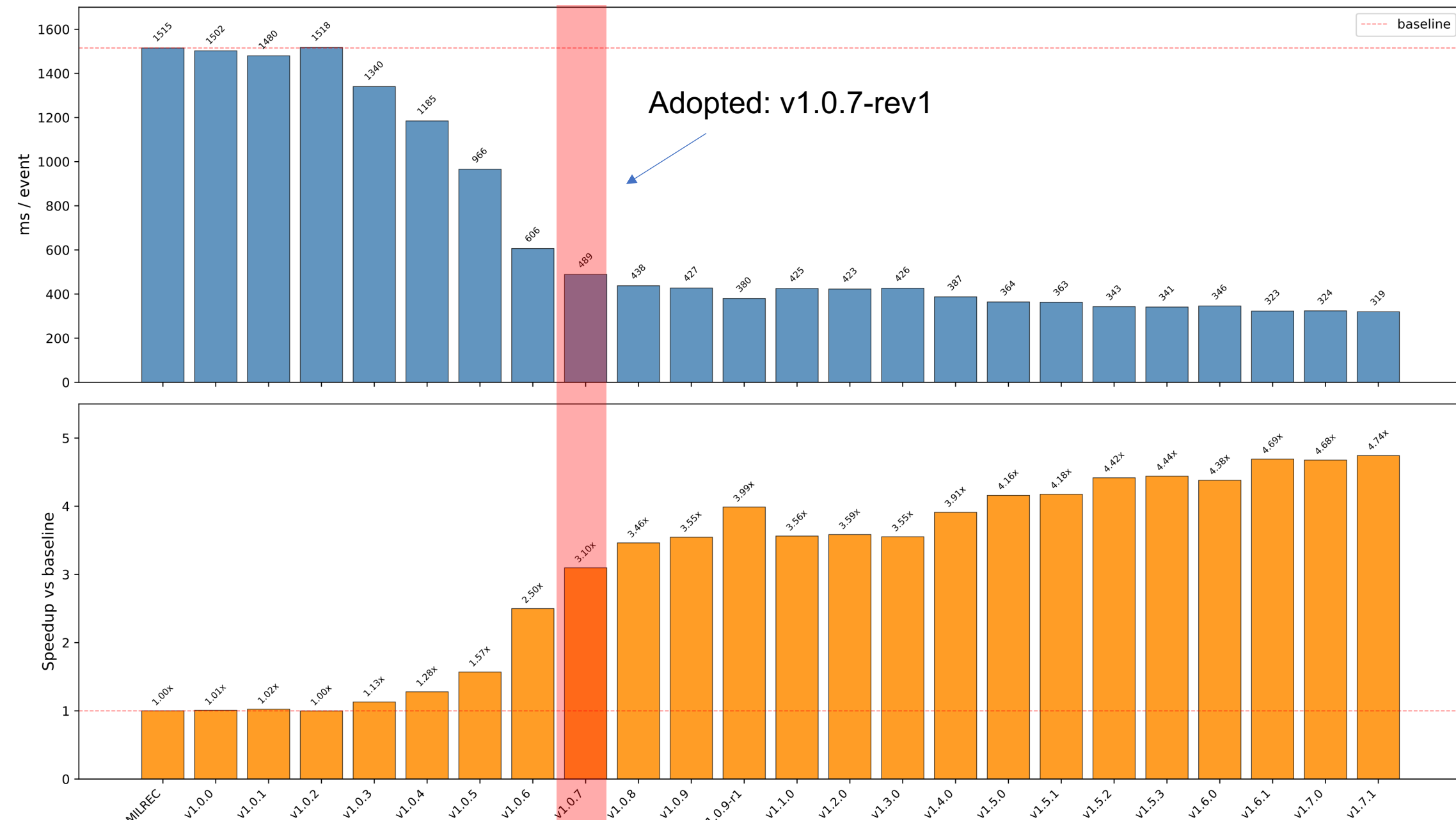


JUNO
analysis scale

Roadmap: 5 stage optimization

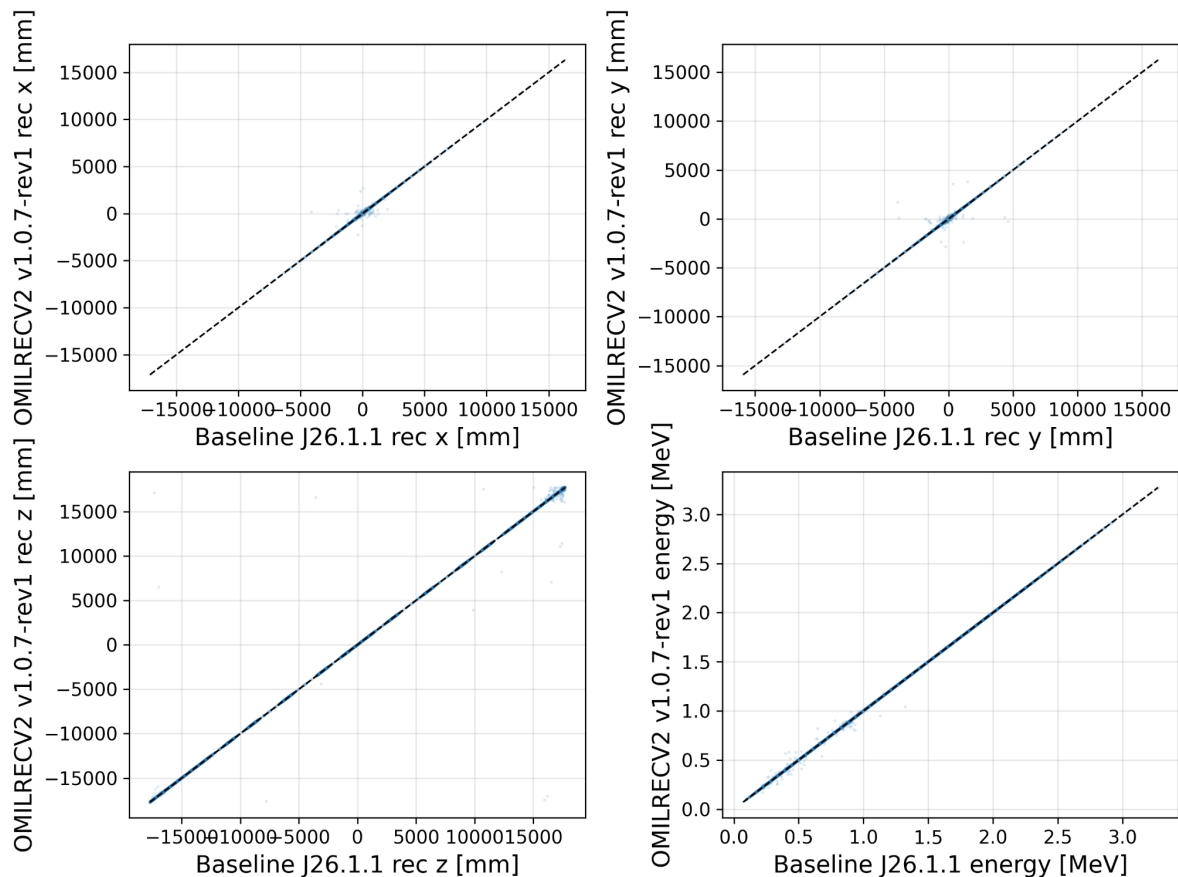


OMILRECv2 Speed Evolution (1000 events, IHEP E5-2650 v2 @ 2.60GHz)

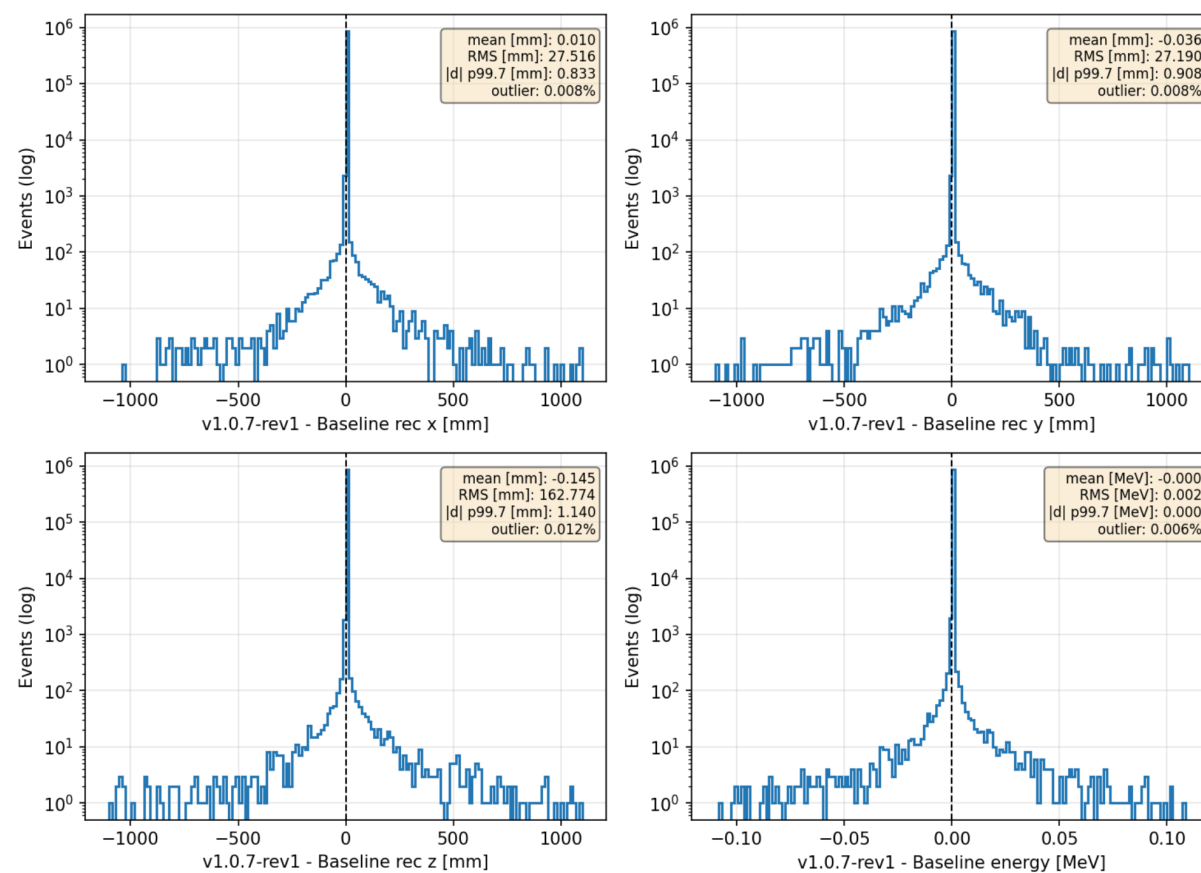


Physical verification on ^{68}Ge

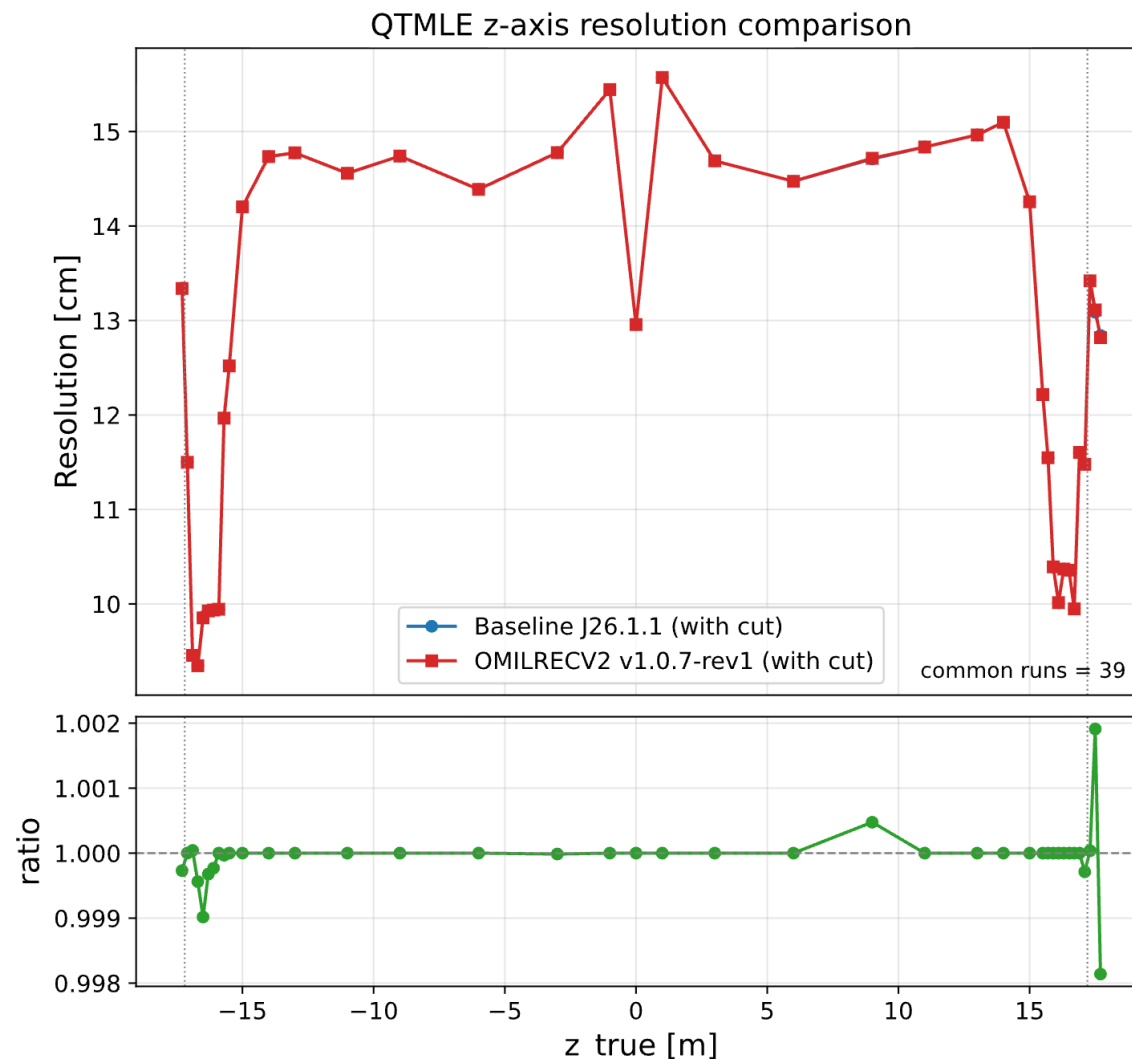
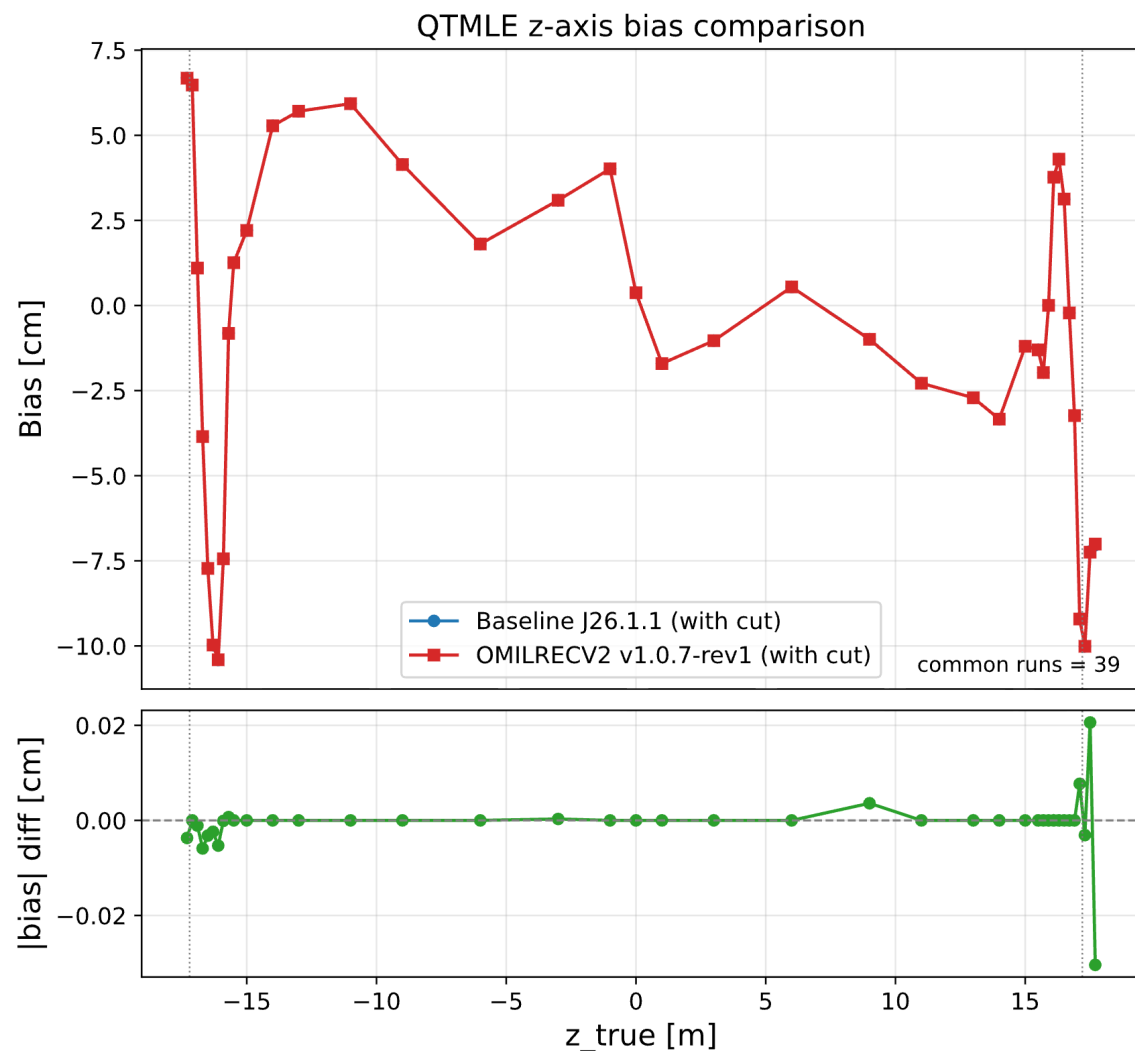
Event-by-event: Baseline J26.1.1 vs OMILREC2 v1.0.7-rev1 (events=861412)



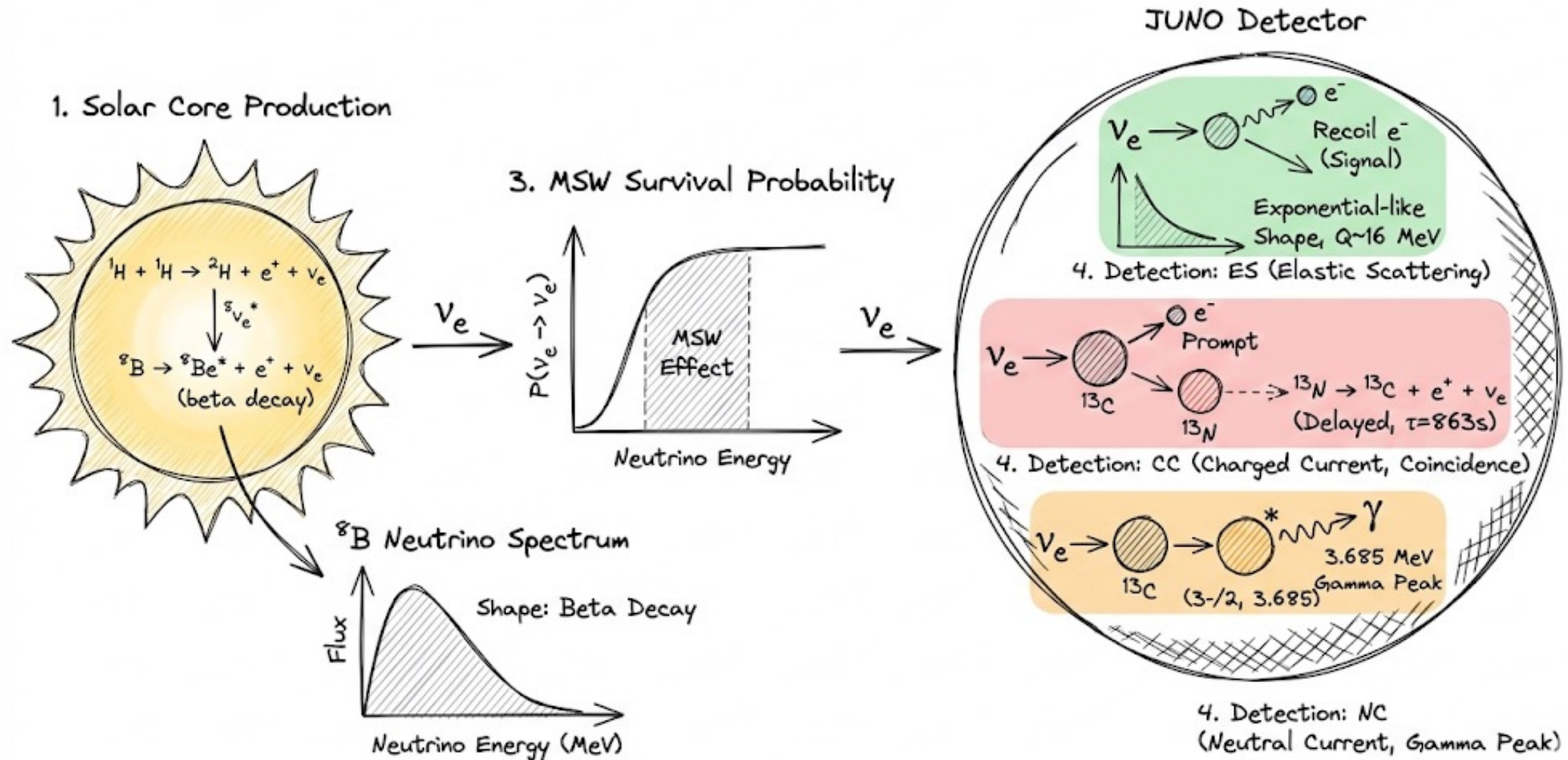
Differences: v1.0.7-rev1 - Baseline (y-axis log scale)



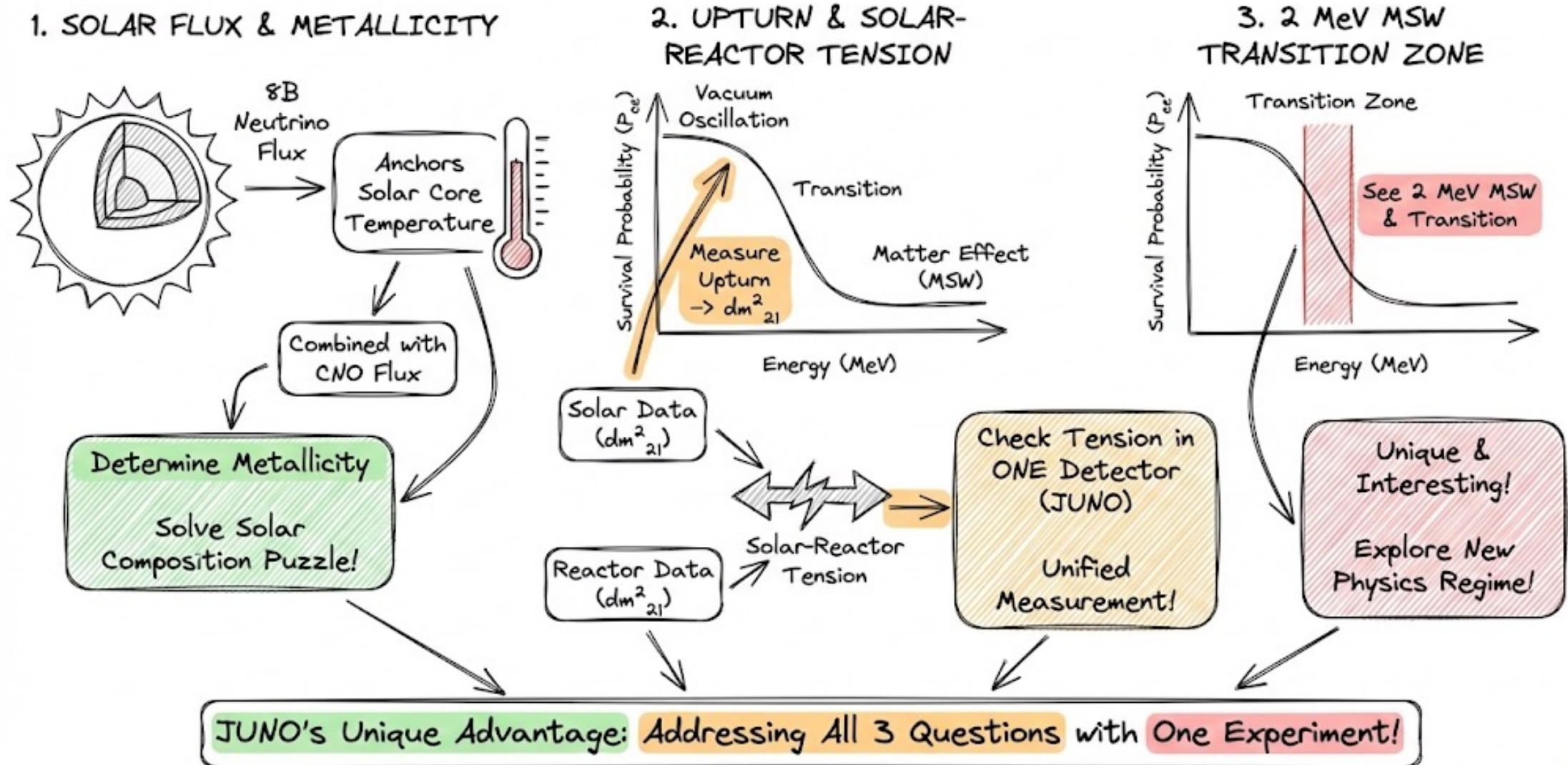
Physical verification on ^{68}Ge



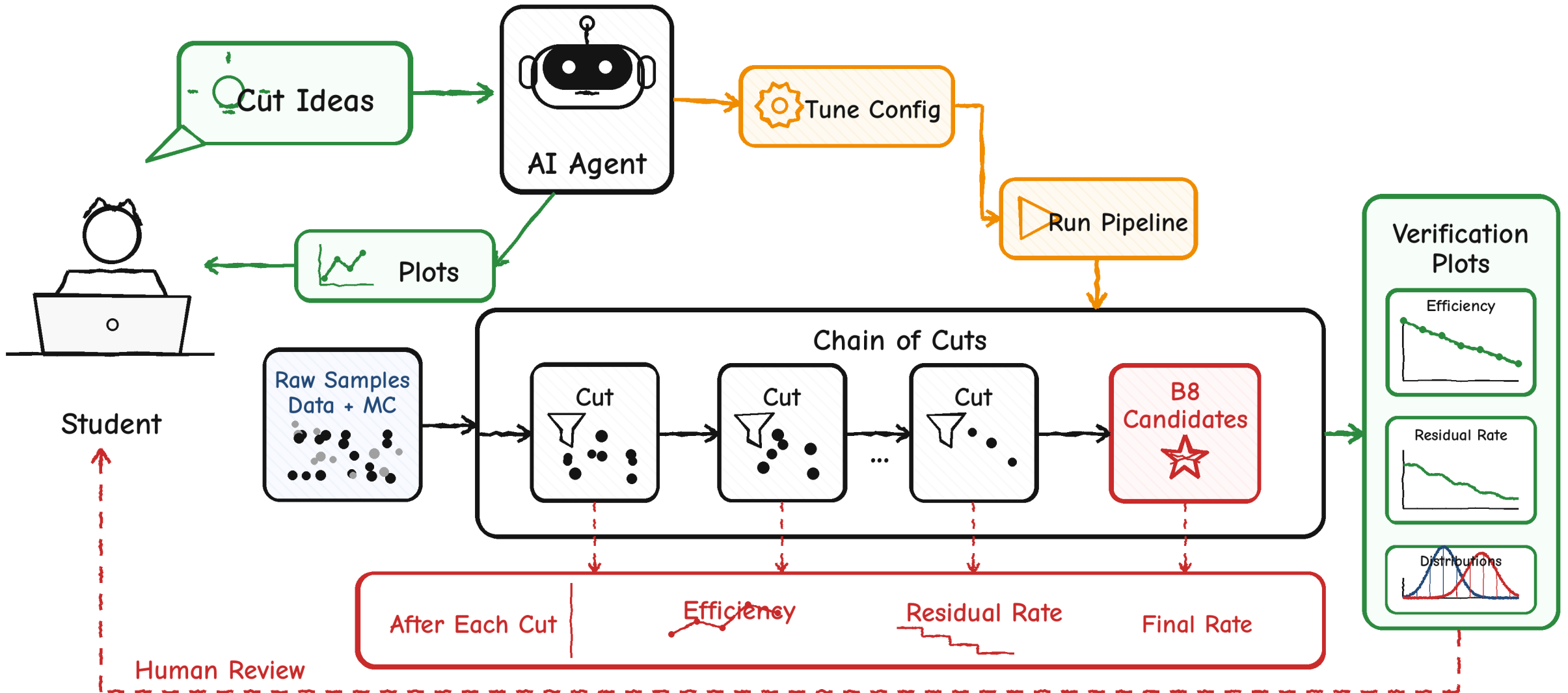
Detection of ^8B solar neutrino



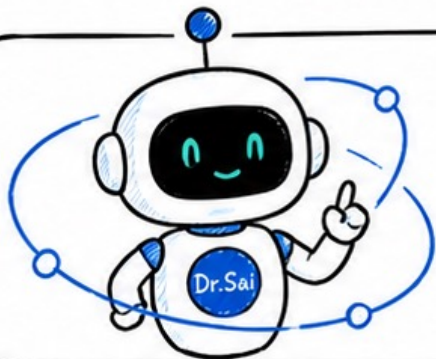
Scientific question of ^8B solar ν



Agent in ^8B solar ν analysis



Conclusion



We launched the **Dr.Sai JUNO** project for developing the **agentic workflow** in **JUNO**.

☆ We reviewed the achievement of **agentic workflow**: ☆

OMILREC Acceleration



5×
Speedup

20×
Research
Efficiency

Event Selection of ^8B Analysis

