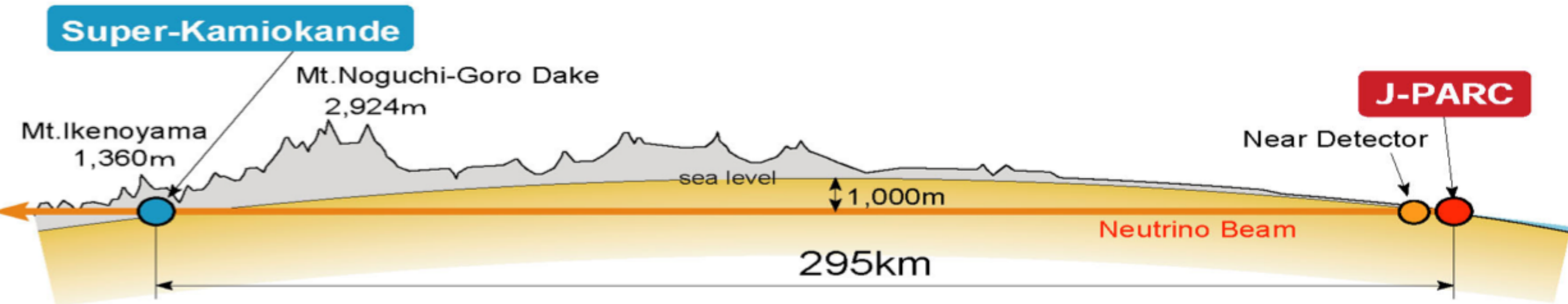




Anti- ν_e Appearance at T2K using VALOR

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- 2.5° Off-axis $\nu_\mu/\text{anti-}\nu_\mu$ Beam (0.6 GeV)
- μ -Like, e-Like samples in ν and anti- ν mode
- VALOR: Frequentist limits



anti- ν_e Appearance



Goal: See anti- ν_e appearance!

- $P_{\text{osc}} = P_{\text{osc}}(\text{PMNS})$ for $\nu_e, \nu_\mu, \text{anti-}\nu_\mu$
- New parameter β (0 or 1)
- $P_{\text{osc}}(\nu_\mu\text{Bar} \rightarrow \nu_e\text{Bar}) = \beta \times P_{\text{osc}}(\text{PMNS})$
- Find p-value of anti- ν_e appearance

P-Value:

The probability to observe data that is as or more extreme than the data observed, given the null hypothesis is true

1. Define a null hypothesis ($\beta=0$)
2. Define a test statistic (#events or $\chi^2(\beta=0) - \chi^2(\beta=1)$)
- 3. Compute the distribution of the test statistic for the null hypothesis**
4. Evaluate the test statistic for the data
5. Compare the data test statistic with the distribution