Study of semi-inclusive characteristics for $B \rightarrow D/D_s$ h X decays at Belle II

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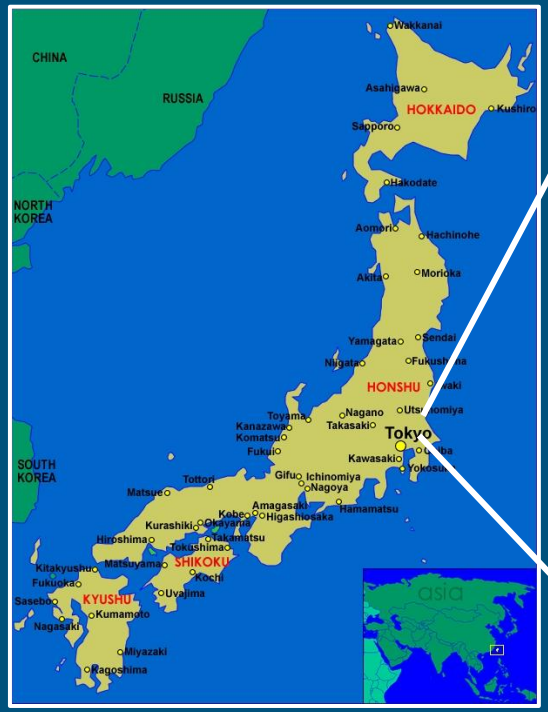
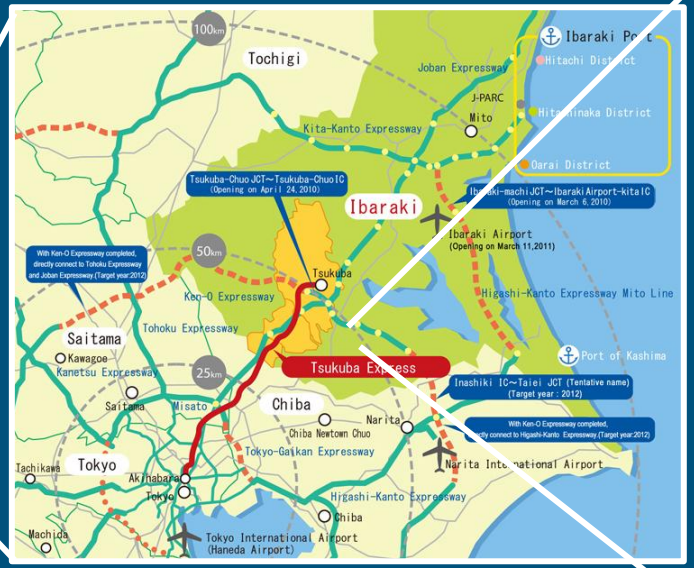
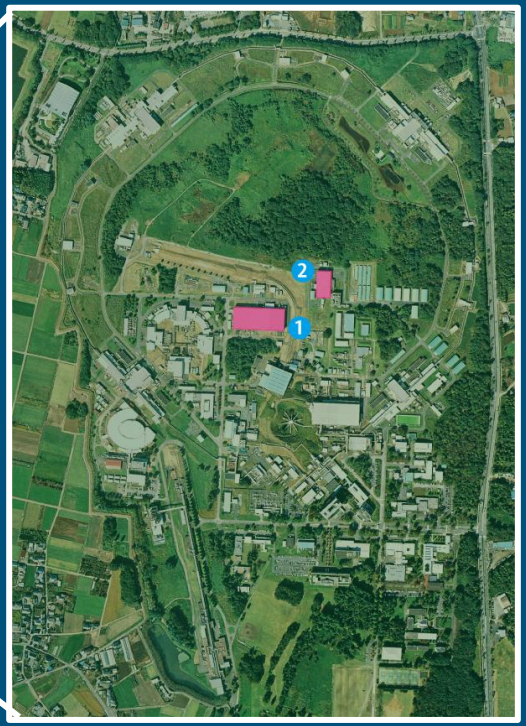
Belle II collaboration

SuperKEKB - where?



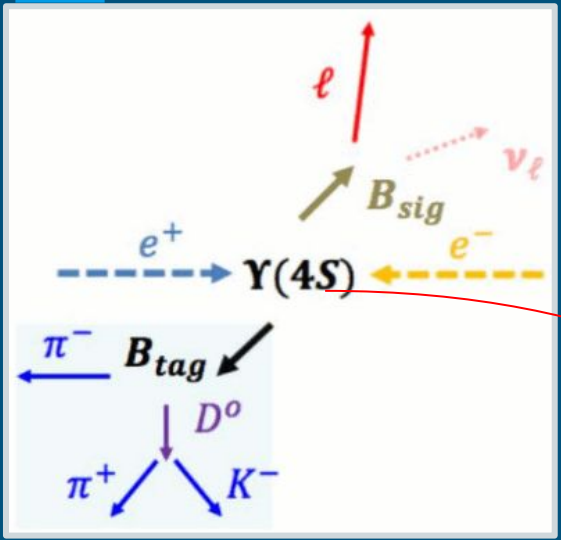




B-factory


Mt. Tsukuba
~ 1 km
BELLE II
KEKB Ring
~ 1.5 km
Damping Ring
Linac
KEK Tsukuba Campus

Why do we need B-factory?



$$\mathcal{B}(\Upsilon(4S) \to B\bar{B}) > 96\%$$

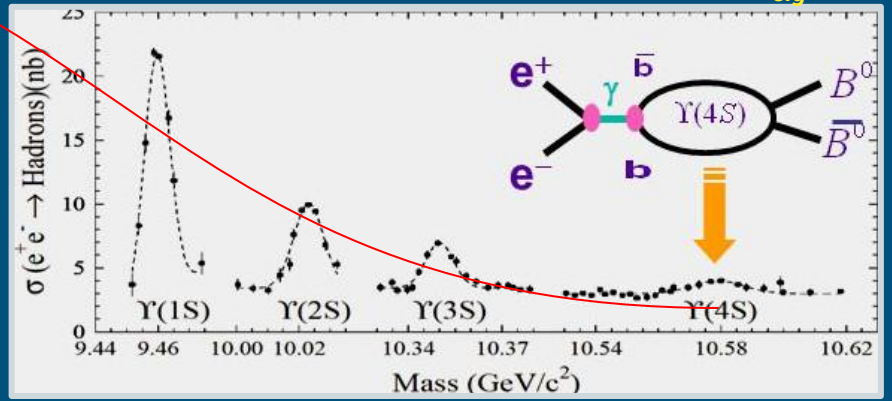
⇒ nothing but BB-bar in the final state

We exploit the reaction process

$$e^+e^- \to \Upsilon(4S) \to B_{tag}\bar{B}_{sig}$$

➔ full reconstruction of B_{tag} decay chain

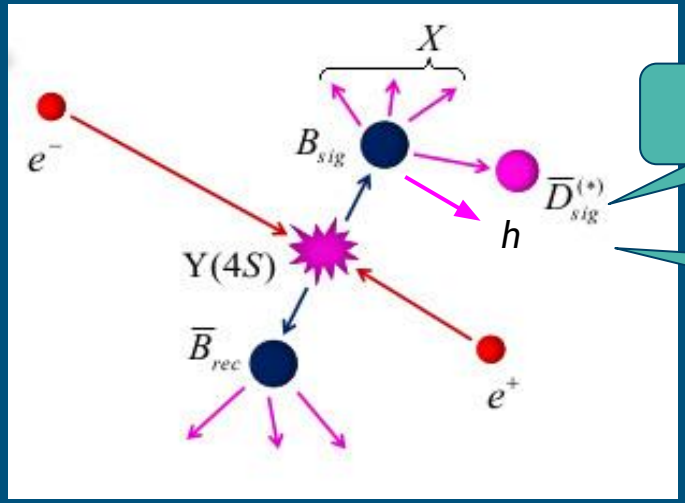
➔ constrain the (E, p), charge, flavor, etc. of B_{sig}



★ **Making B's at hadron colliders (e.g. LHCb)**
- huge number of B mesons are produced but
- no info. on p_B, unless you actually reconstruct the B meson

★ **Making B's at e^+ e^- colliders with**
- a moderate number of B mesons are produced
- $E_B = \sqrt{s}/2 \sim 5.29$ GeV ; $|\vec{p}_B| \sim 0.35$ GeV/c

Inclusive Charm Reconstruction



$$M_X = \sqrt{(p(\Upsilon(4S)) - p(B_{tag}) - p(D_{sig}^{(*)}) - p(h))^2}$$

Tools of Belle II Analysis

- **B_{tag}** is reconstructed by **Full Event Interpretation** (**FEI**) technique

- **B_{sig}** will be reconstructed by the **Python** program that will be written by someone of you

- Visualization of the obtained results will be done by **ROOT** or **ROOFit**

Thank you for your attention

and I invite you to participate in this project :)