

## Study of $\phi(2170)$ at BESIII

*Wednesday, 18 August 2021 14:15 (15 minutes)*

In  $e^+e^-$  collisions between 2 and 3 GeV, excited states of  $\rho$ ,  $\omega$  and  $\phi$  can be produced directly. Especially the resonances around 2GeV like  $\rho(2000)$ ,  $\rho(2150)$  and  $\phi(2170)$  are not fully understood yet. Theorists describe the  $\phi(2170)$  as a traditional  $s\bar{s}$  state, an  $s\bar{s}g$  hybrid, a tetraquark state, a  $\Lambda\bar{\Lambda}$  bound state, or a  $\phi$  KK resonance. The predicted decay widths vary strongly depending on the assumed nature of  $\phi(2170)$ . With energy scan data collected by the BESIII collaboration between 2.0 GeV and 3.08 GeV, the properties of  $\phi(2170)$  are studied systematically in PWAs of its expected decay modes, such as  $e^+e^- \rightarrow K^+K^-\pi^0$ ,  $\phi\eta'$ ,  $\phi\eta$ ,  $K^+K^-$ , and  $\eta'\pi^+\pi^-$ .

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**Session Classification:** Parallel Session II: Hadron and Flavor Physics

**Track Classification:** 2. 强子物理与味物理