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Title:	Measurements of the Branching Fractions of the Semileptonic Decays $\Xi^0 c \rightarrow \Xi^- \ell^+ \nu \ell$ and the Asymmetry Parameter of $\Xi^0 c \rightarrow \Xi^- \pi^+$
Authors:	Bhardwaj, Vishal (/jspui/browse?type=author&value=Bhardwaj%2C+Vishal) Patra, Sourav (/jspui/browse?type=author&value=Patra%2C+Sourav)
Keywords:	Lepton colliders charmed baryons
Issue Date:	2021
Publisher:	American Physical Society
Citation:	Physical Review Letters, 127(12).
Abstract:	Using data samples of 89.5 and 711 fb ⁻¹ recorded at energies of $\sqrt{s} \approx 10.52$ and 10.58 GeV, respectively, with the Belle detector at the KEKB e ⁺ e ⁻ collider, we report measurements of branching fractions of semileptonic decays $\Xi^0 c \rightarrow \Xi^- \ell^+ \nu \ell$ ($\ell = e$ or μ) and the CP-asymmetry parameter of $\Xi^0 c \rightarrow \Xi^- \pi^+$ decay. The branching fractions are measured to be $\mathcal{B}(\Xi^0 c \rightarrow \Xi^- e^+ \nu_e) = 1.31 \pm 0.04 \pm 0.07 \pm 0.38\%$ and $\mathcal{B}(\Xi^0 c \rightarrow \Xi^- \mu^+ \nu_\mu) = 1.27 \pm 0.06 \pm 0.10 \pm 0.37\%$, and the decay parameter $\alpha_{\Xi\pi}$ is measured to be $0.63 \pm 0.03 \pm 0.01$ with much improved precision compared with the current world average. The corresponding ratio $\mathcal{B}(\Xi^0 c \rightarrow \Xi^- e^+ \nu_e) = \mathcal{B}(\Xi^0 c \rightarrow \Xi^- \mu^+ \nu_\mu)$ is $1.03 \pm 0.05 \pm 0.07$, which is consistent with the expectation of lepton flavor universality. The first measured asymmetry parameter $ACP(\Xi^0 c \rightarrow \Xi^- \pi^+) = \alpha_{\Xi\pi} - \alpha_{\Xi\pi}^{\text{CP}}$ is 0.052 ± 0.014 is found to be consistent with zero. The first and the second uncertainties above are statistical and systematic, respectively, while the third ones arise due to the uncertainty of the $\Xi^0 c \rightarrow \Xi^- \pi^+$ branching fraction.
Description:	Only IISER Mohali authors are available in the record.
URI:	https://doi.org/10.1103/PhysRevLett.127.121803 (https://doi.org/10.1103/PhysRevLett.127.121803) http://hdl.handle.net/123456789/5201 (http://hdl.handle.net/123456789/5201)
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