

$D_{(s)}$ and Charmonium Physics at CLEO

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The CLEO-c experiment has accumulated a wide variety of data sets. A sample of 3 million $\psi(2S)$ decays is used for extensive studies of charmonium states including spectroscopy (e.g., the discovery of the h_{c1}), partial widths of the J/ψ , $\psi(2S)$, $\psi(3770)$, and studies of the χ_{cJ} states. A sample of 281 pb^{-1} at $E_{cm} = 3.77 \text{ GeV}$ yields clean samples of D^0 and D^+ mesons, providing the world's best measurements of absolute hadronic branching ratios, inclusive and exclusive semileptonic branching ratios and form-factors, and the decay constant f_D . A recent energy scan from $3.90 - 4.26 \text{ GeV}$ identified the optimal running point for D_s physics while also providing detailed measurements of the production rates into various exclusive meson-pair channels. Subsequent running at $E_{cm} = 4.17 \text{ GeV}$ has begun in order to obtain D_s physics results which will parallel those from the 3.77 GeV data. Our precision results offer an opportunity to test modern Lattice QCD calculations. Finally, Dalitz analyses of the decays of various charm states also provide a unique laboratory for investigation of low-energy spectroscopy and final-state interaction phases.

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