

# $D_{(s)}$ 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  $J/\psi$ ,  $\psi(2S)$ ,  $\psi(3770)$ , and studies of the  $\chi_{cJ}$  states. A sample of  $281 \text{ pb}^{-1}$  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  $3.77 \text{ GeV}$  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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