

A morphological and multicolor HST survey for faint quasars

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Quasars that are representative of the populous faint end of the luminosity function are frustratingly dim, with $m > 24$ even at intermediate redshift. Moreover, ground-based surveys for such faint QSOs suffer from severe morphological contamination by compact galaxies. To address this problem we have conducted a morphological and multicolor archival HST survey for quasars to $B \lesssim 24.5$ and $z \lesssim 2.1$. Our survey is based on 31 high-galactic latitude “parallel” fields that have been imaged in the I, R, and U bands, and cover 0.04 deg^2 of the sky. It takes advantage of the superb $0.1''$ spatial resolution of the Wide Field Planetary Camera 2 (WFPC2), and builds on previous work in the Groth-Wesphal Strip that supplemented R and I-band WFPC2 CCD images with ground-based U-band data. We identify 19 high-likelihood UV-excess candidates with stellar or stellar nucleus + galaxy morphology in WFPC2, yielding a cumulative surface density to $B \lesssim 24.5$ of $511_{-113}^{+142} \text{ deg}^{-2}$. Our results are in reasonably good agreement with recent large groundbased surveys and provide interesting statistical constraints on theoretical QSO evolution models.