On the decline in the comoving density of quasars between z = 2 and z = 4

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We compiled a complete sample of 13 optically bright radio-loud quasars with $3.9 < z < 4.5$ by cross-correlating the FIRST and the APM surveys. For this sample we derived a comoving space density of $\rho = 0.74 \pm 0.19$ Gpc^{-3}. Comparison with a sample of equally luminous radio-loud quasars from the FIRST Bright Quasar Survey, at z $\approx$ 2, shows a drop by a factor of 2 ± 0.7 in comoving space density from z = 2 to z = 4. ¿From a new accurate measurement of the radio-loud fraction of quasars we calculated the total space density of quasars with $\mathrm{M}_{AB}(1450\text{Å}) < -27^m$ to be $\rho = 6.4 \pm 1.6$ Gpc^{-3}. By comparison with the comoving space density at z = 2 of the 2dF quasar survey, at the same optical luminosity, we find a ratio of 2.8 ± 0.8, fully consistent with that of the radio-loud quasars, but significantly different from the generally quoted ratio ≥ 10. Since our quasar sample includes the higher optical luminosities, we argue that the decline of the space density with increasing redshift beyond z = 2 is much slower for optically bright quasars.