RED GALAXIES AROUND A QUASAR AT Z=1.1 AND THEIR AGES

I. TANAKA AND T. YAMADA
Astronomical Institute, Tohoku University, Aoba-ku, Sendai 980-77, Japan

A. ARAGÓN-SALAMANCA AND T. KODAMA
Institute of Astronomy, Madingley Road, Cambridge, CB3 0HA, UK

K. OHTA
Department of Astronomy, Kyoto University, Kyoto, 606-01, Japan

AND

N. ARIMOTO
Institute of Astronomy, University of Tokyo, Mitaka, Tokyo 181, Japan

We obtained near-infrared and new deep optical images of the field near the radio-loud quasar 1335.8+2834 at z=1.086 where excess of galaxy surface number density was reported by Huthings et al. [AJ, 106, 1324]. We found a clustering of objects with very red optical-NIR color, $4 < R-K < 6$ and $3 < I-K < 5$ near the quasar. The colors and magnitude of the reddest objects are consistent with those predicted for luminous ($> 0.5L_*$) and old (2-4 Gyr old) passively evolving elliptical galaxies at z=1.1.

The reddest and the brightest cluster member has $K = 17.3$, $R - K = 5.7$, and $I-K = 4.3$ and its colors are well fitted by the model spectrum of a 3-3.5 Gyr-old passively evolving elliptical galaxy observed at z=1.1, without reddening effects by dust extinction or other reasons. This constrains the age of the universe; if $q_0 = 0.5$, $H_0 < 60$ km s^{-1} Mpc^{-1} is needed.

For more details, see Yamada et al. [*ApJ Letters*, (1997), **487**, pp.125–129] and Tanaka et al. (1997, in preparation).

e-mail: ichi@astr.tohoku.ac.jp

K. Sato (ed.), Cosmological Parameters and the Evolution of the Universe, 164.