Results from the Ground-Based Follow-up Program of CoRoT Planets with BEST II

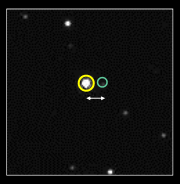
R. Titz-Weider[1], J. Cabrera[1], R. Chini[2,3], Sz. Csizmadia[1], C. Dreyer[1,4], Ph. Eigmüller[1], A. Erikson[1], Th. Fruth[1], P. Kabath[5], S. Kirste[1], P. Klagyivik[6], R. Lemke[2], M. Murphy[7], Th. Pasternacki[1], H. Rauer[1,4]

[1] Institut für Planetenforschung, DLR, Rutherfordstr. 2, D-12489 Berlin
[2] Astronomisches Institut, Ruhr-Universität Bochum, D-44780 Bochum
[3] Instituto de Astronomía, Universidad Católica del Norte, Antofagasta, Chile.
[4] Zentrum für Astronomie und Astrophysik, TU Berlin, D-10623 Berlin
[5] ESO, Alonso de Córdava 3107, Vitacura, Casilla 19001, Santiago 19, Chile
[6] Konkoly Observatory, H-1121 Budapest XII, Konkoly Thege út 15-17, Hungary
[7] Depto. Física, Universidad Católica del Norte, PO 1280, Antofagasta, Chile
contact: ruth.titz@dlr.de

BEST II and the CoRoT Mission

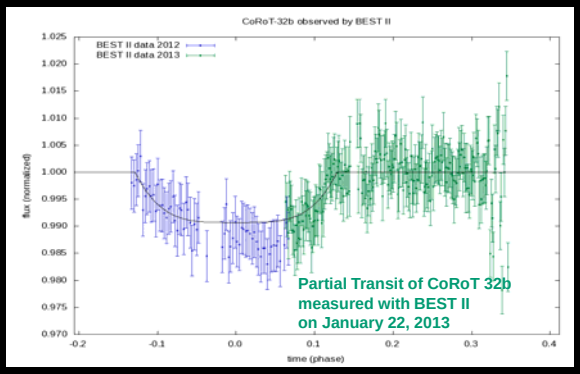
BEST II (Berlin Exoplanet Search Telescope) operates as ground based support for the CoRoT space mission since 2007. The telescope is described in detail on the poster "BEST II – A photometric Survey Telescope in the Atacama Desert" by Fruth et al.
Our observations are used to validate the nature of CoRoT planetary candidates by ruling out false positive scenarios and by providing further constraints in the planetary parameters and ephemerides. Here we present two representative results of our program concerning the follow-up of the planets CoRoT-24, the first multiple system detected by CoRoT, and CoRoT-32, an intriguing planet in a 20 day orbit around a hot star.

CoRoT-32b

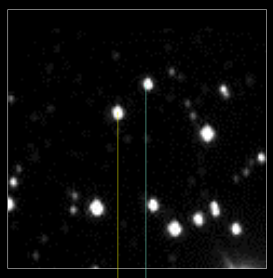


CoRoT 32 as seen by BEST II in the center is clearly separated from stars in the neighbourhood. V=16 mag star (o) in 18" distance is the nearest neighbour.

CoRoT-32b is a Jupiter-like transiting planet (depth~1%) in a 20 day orbit around a relatively bright star (see talk given by Davide Gandolfi).
CoRoT-32 appeared in CoRoT's short run field SRa04 which was observed in October/November 2011. BEST II observed the field SRa04 for several nights in winter 2011/2012 and on January 22, 2013 especially aiming at CoRoT-32b.The observations led to a revision of the ephermerides. The picture below shows a composed light curve of CoRoT-32b taken by BEST II: The transit egress in January 2103 appeared around two hours earlier than predicted by the preliminary CoRoT ephermeides.



CoRoT-24b



CoRoT-24 harbours a multiple planetary system with two Neptun sized planets, CoRoT-24b and CoRoT-24c, both transiting planets.

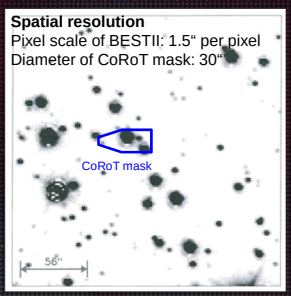
V=15.66 mag star 28" distance: nearest detectable neighbour

CoRoT-24 (LRa02_E1_4601)

CoRoT-24 (LRa02_E1_4601) is a star in the CoRoT long run field LRa04 which was observed in winter 2008/2009.
One year earlier, BEST II observed the field LRa02 between November 2007 and March 2008 during 41 nights (231 hours).
We could not detect a transit, because the depth of 0.3% is beyond the capability of BEST II. But we confirm that the CoRoT signal is on target and there are no contaminating stars around.

BEST II as part of the CoRoT follow-up program

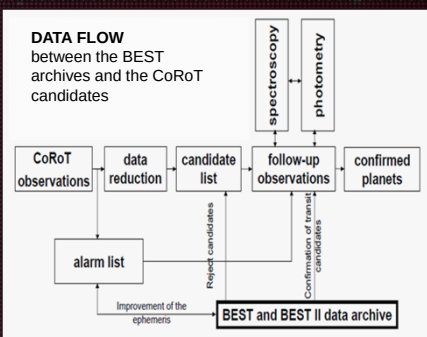
Spatial resolution
Pixel scale of BESTII: 1.5" per pixel
Diameter of CoRoT mask: 30"



Part of a BEST II image with a typical CoRoT-PSF of a star

For CoRoT-24b and CoRoT-32b and several other candidates, BEST II confirmed that the CoRoT signal is on target

DATA FLOW
between the BEST archives and the CoRoT candidates



General Information:
www.dlr.de/caesp
www.corot.de
www.exoplanet.eu

References:
Alonso et al. 2008, A&A, 482, L21-L24
Alonso et al. 2012, A&A, submitted
Fruth et al. 2012, AJ, 143, 140
Rauer et al. 2010, AJ, 139, 53-58

Poster background – NGC 2264 and the Christmas Tree cluster © ESO 2008 (La Silla).