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MOST and 10 Aql

D. Huber[1], H. Saio[2], M. Gruberbauer[1], W.W. Weiss[1], J.F. Rowe[3], M. Hareter[1], T. Kallinger[1], P. Reegen[1], J.M. Matthews[3], R. Kuschnig[1], D.B. Guenther[4], A.F.J. Moffat[4], S. Rucinski[4], D. Sasselov[4] and G.A.H. Walker[3]

[1] *Institute for Astronomy, University of Vienna, Türkenschanzstrasse 17, 1180 Vienna, Austria,*

[2] *Astronomical Institute, Graduate School of Science, Tohoku University, Sendai, 980-8578, Japan,*

[3] *Dept. Physics and Astronomy, University of British Columbia, 6224 Agricultural Road, Vancouver, BC V6T 1Z1, Canada*

[4] *The MOST Science Team at St. Marys Univ., Univ. of Montreal, Univ. of Toronto and Harvard CfA*

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Abstract. MOST[1] space-based photometry of the roAp star 10 Aql is presented.

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1. Photometry and frequency analysis

10 Aql was observed by MOST for 31.2 days during June/July 2006, yielding almost uninterrupted photometric monitoring with a duty cycle of 98 %.

Figure 1 (top panel) shows an amplitude spectrum of the data, revealing three pulsation frequencies with high S/N. Two of them (labelled f_1, f_2) have been previously reported by Heller and Kramer (1990), however wrongly identified as $1\,\mathrm{d}^{-1}$ aliases of the real frequency values. The long coverage of MOST observations enable us to resolve an additional mode (f_3). We do not detect another published mode by Heller and Kramer (1990) and Belmonte *et al.* (1991) (bottom panel), which might be an indication for a limited mode lifetime in this roAp star. None of the detected frequencies show up in the spectrum of a simultaneously observed guide star or a frequency analysis of the background readings (middle panel). We furthermore detect two candidate frequencies ($f_\mathrm{i}, f_\mathrm{j}$) with $S/N \sim 4$. The intrinsic nature of this signal cannot be confirmed with the available data. No amplitude modulation of the frequencies could be detected, confirming the long rotation period for this star as found with simultaneous UVES spectroscopy by Sachkov *et al.* (2008).

[1]Based on data from the MOST satellite, a Canadian Space Agency mission, jointly operated by Dynacon Inc., the University of Toronto Institute for Aerospace Studies and the University of British Columbia, with the assistance of the University of Vienna.

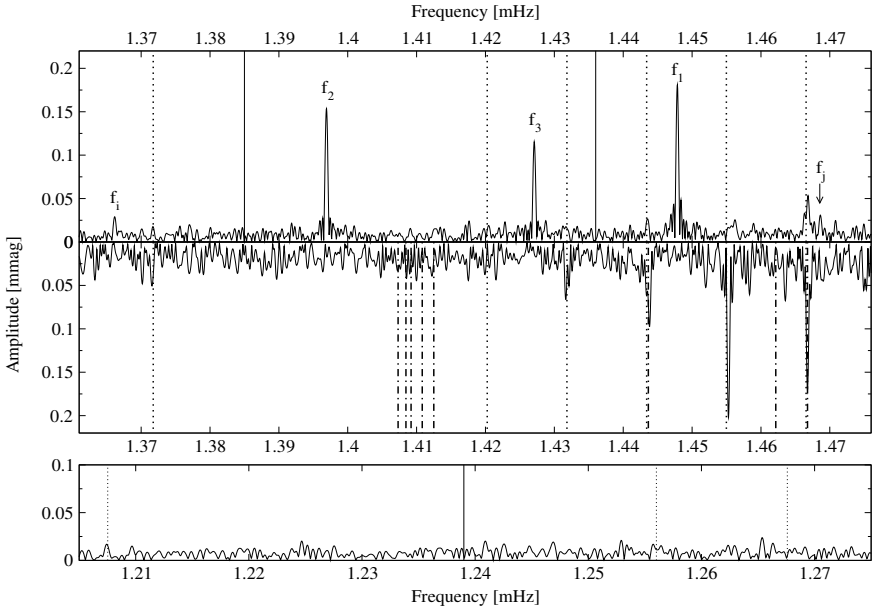

Figure 1. Amplitude spectra of 10 Aql (top and bottom panel) and a simultaneously observed star (middle panel). *Solid lines:* previously reported frequencies; *Dotted lines:* instrumental artifacts; *Dashed-dotted lines:* signal found in the background readings.

2. Model fitting

We attempted to fit the observed frequencies to magnetic models calculated using the method of Saio (2005). Due to the low number of observed modes the results are not unambiguous. The best χ^2 values appear for a $1.95\,M_{\odot}$ model with envelope convection suppressed, no gravitational helium settling and a polar magnetic field strength $B_{\rm P} \sim 3\,$kG. The resulting effective temperature is consistent with previous findings. The luminosity, however, is in slight discrepancy with the $1\,\sigma$ error of the Hipparcos parallax. A complete description of the data and analysis will be published soon (Huber *et al.*, 2008, in preparation).

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