

# B fields in OB stars (BOB): FORS2 spectropolarimetric follow-up of the two rare rigidly rotating magnetosphere stars HD23478 and HD345439

S. Hubrig(1), M. Schoeller(2), L. Fossati(3), T. Morel(4), N. Castro(3), L.M. Oskinova(5), N. Przybilla(6), S.S. Eikenberry(7), M.F. Nieva(6), N. Langer(3), the BOB collaboration

- (1) Leibniz-Institut fuer Astrophysik Potsdam (AIP), An der Sternwarte 16, 14482 Potsdam, Germany,
- (2) European Southern Observatory, Karl-Schwarzschild-Str. 2, 85748 Garching, Germany,
- (3) Argelander-Institut fuer Astronomie, Universitaet Bonn, Auf dem Huegel 71, 53121 Bonn, Germany,
- (4) Institut d'Astrophysique et de Geophysique, Universite de Liege, Allee du 6 Aout, Bat. B5c, 4000 Liege, Belgium,
- (5) Universitaet Potsdam, Institut fuer Physik und Astronomie, 14476 Potsdam, Germany,
- (6) Institute for Astro- and Particle Physics, University of Innsbruck, Technikerstr. 25/8, 6020 Innsbruck, Austria,
- (7) Department of Astronomy, University of Florida, 2011 Bryant Space Center, Gainesville, FL 32611

Massive B-type stars with strong magnetic fields and fast rotation are very rare and pose a mystery for theories of star formation and magnetic field evolution. Only two such stars, called sigma Ori E analogues, were known until recently. A team involved in APOGEE, one of the Sloan Digital Sky Survey III programs, announced the discovery of two additional rigidly rotating magnetosphere stars, HD23478 and HD345439. The magnetic fields in these newly discovered sigma Ori E analogues have not been investigated so far.

In the framework of our ESO Large Programme and one normal ESO programme, we carried out low-resolution FORS2 spectropolarimetric observations of HD23478 and HD345439.

In the measurements of hydrogen lines, we discover a rather strong longitudinal magnetic field of up to 1.5kG in HD23478 and up to 1.3kG using the entire spectrum. The analysis of HD345439 using four subsequent spectropolarimetric subexposures does not reveal a magnetic field at a significance level of 3sigma. On the other hand, individual subexposures indicate that HD345439 may host a strong magnetic field that rapidly varies over 88 minutes. The fast rotation of HD345439 is also indicated by the behaviour of several metallic and He I lines in the low-resolution FORS2 spectra that show profile variations already on this short time-scale.

Reference: Accepted for publication as a letter to A&A.

Status: Manuscript has been accepted

Weblink: <http://arxiv.org/abs/1505.02447>

Comments:

Email: [shubrig@aip.de](mailto:shubrig@aip.de)