

# Asteroseismology of massive stars with the MOST satellite

Anthony F. J. Moffat<sup>1</sup> and The MOST Team

<sup>1</sup>Département de physique, Université de Montréal,  
C.P. 6128, Succursale Centre-ville, Montréal, QC, H3C 3J7, Canada  
email: moffat@astro.umontreal.ca

**Abstract.** Since 2003 the MOST (Microvariability and Oscillations of STars) microsatellite has obtained typically a month of non-stop, minute-of-time resolution, high-precision, single-broadband optical photometry for each of a significant number of Galactic OB and WR stars. Numerous p- and g-modes were clearly detected in several OB stars, including discovery of g-modes for the first time in a blue supergiant (Saio *et al.* 2006). True rotation periods were found for some SPBe pulsators (Cameron *et al.* 2008). Many O stars are remarkably quiet. Five presumably single WR stars have been observed so far, each interesting in its own way. In particular, the cool WR stars WR123 (WN8) and WR103 (WC9d) both show mostly short-lived, multimode oscillations with most of the Fourier power occurring on a day or longer timescale (Moffat *et al.* 2008a). WR123 also revealed a fairly stable 10-hour periodicity (Lefèvre *et al.* 2005). All of these oscillations probably arise in the stellar cores. WR111 (WC5) shows no (coherent) oscillations above the detection limit of 0.05 mmag in the 10-minute period range predicted for strange-mode pulsations at a level of 2 mmag (Moffat *et al.* 2008b). WR110 (WN5-6 and a stronger-than-average X-ray source) and WR124 (WN8h, i.e. in contrast with the previously observed, hydrogen-free WR123 of otherwise similar subtype), both strongly variable with MOST, are currently being analyzed. The next target just observed (late-June to early Aug 2009) is the 30-day eclipsing binary CV Ser = WR113 (WC8d + O8-9IV). Besides stellar oscillations, we will also search for orbital-phase dependent, stochastic variability in CV Ser as wind clumps in the WR component's dense wind pass in front of the O-star.

**Keywords.** Space vehicles, stars: early-type, stars: oscillations (including pulsations), stars: Wolf-Rayet.

---

## References

- Cameron, C., Saio, H., Kuschnig, R., Walker, G. A. H., Matthews, J. M., Guenther, D. B., Moffat, A. F. J., Rucinski, S. M., Sasselov, D., Weiss, W. W. 2008, *ApJ*, 685, 489
- Lefèvre, L., Marchenko, S. V., Moffat, A. F. J., Chené, A. N., Smith, S. R., St-Louis, N., Matthews, J. M., Kuschnig, R., Guenther, D. B., Poteet, C. A., Rucinski, S. M., Sasselov, D., Walker, G. A. H., Weiss, W. W. 2005, *ApJ*, 634, L109
- Moffat, A. F. J., Marchenko, S. V., Lefèvre, L., Chené, A.-N., St-Louis, N., Zhilyaev, B. E., Aerts, C., Saio, H., Walker, G. A. H., Matthews, J. M., Kuschnig, R., Cameron, C., Rowe, J. F., Guenther, D. B., Rucinski, S. M., Sasselov, D., Weiss, W. W. 2008a, in: A. de Koter, L. J. Smith, & L. B. F. M. Waters (eds.), *ASP Conference Series* (San Francisco: Astronomical Society of the Pacific), 388, 29
- Moffat, A. F. J., Marchenko, S. V., Zhilyaev, B. E., Rowe, J. F., Muntean, V., Chené, A.-N., Matthews, J. M., Kuschnig, R., Guenther, D. B., Rucinski, S. M., Sasselov, D., Walker, G. A. H., Weiss, W. W., 2008b, *ApJ*, 679, L45
- Saio, H., Kuschnig, R., Gautschi, A., Cameron, C., Walker, G. A. H., Matthews, J. M., Guenther, D. B., Moffat, A. F. J., Rucinski, S. M., Sasselov, D., Weiss, W. W. 2006, *ApJ*, 650, 1111