

Report on ESO Workshop on Rapid Variability of OB Stars Waves or Spots?

D. BAADE, ESO

Highlighted by some of the most beautiful days which this year's autumn had to offer, a workshop on the rapid variability of OB stars took place on October 15–18 at ESO's Headquarters in Garching. Seventy people had come from twenty countries (as the Director General, H. van der Laan, pointed out in his welcoming address, this number also reflects the rapid political variations in Europe) on five continents to participate in the meeting. Fifteen ESO staff members attended at least part of the workshop.

Over the past ten years, it has become clear that a very large fraction of stars in the upper left of the Hertzsprung–Russell diagram show weak but significant variations in light, colour, line profiles, etc. In some cases, the patterns seen are complicated; but generally they are surprisingly similar over a range of more than 30,000 K in effective temperature and 8 magnitudes in bolometric luminosity. In a number of cases, nonradial pulsation (NRP), mostly travelling waves, is the widely accepted explanation although the driving mechanism(s) is (are) not finally identified.

In other stars, the evidence for NRP is more disputed and especially for stars whose probable rotation periods are statistically indistinguishable from the observed periods, corotating surface features ("spots") might offer a rather different explanation.

The primary aim of the workshop was to provide the basis for a structured discussion of the large and complex observational material which had often led to only partial explanations. A secondary aim was an early reconnaissance of the diagnostic value, if any, of the phenomena. Especially pulsation may provide interesting insights into the internal structure of rapidly evolving OB stars which often is veiled by substantial mass loss. The workshop was fortunate in that it succeeded in gathering a very large fraction of at least the observers engaged in the field.

The Scientific Organizing Committee (SOC; H. Ando, D. Baade, C.T. Bolton, H. Henrichs, L.B. Lucy) had invited nineteen reviews in order to form the scientific backbone of the meeting. The first day was devoted to observations of line profile and photometric variations in various sub-classes of OB stars. The second day started with presentations of other variables, e.g. δ Scuti, magnetic,

and cool spotted stars, where models also considered for OB stars are more firmly established. In the afternoon, papers on possible relations between variations at the photospheric level and in the radiatively driven winds of hot luminous stars were followed by summaries of some of the main models competing for the explanation of the observations. This latter part of the programme was continued on Wednesday morning. The remainder of the agenda addressed the more long-term question whether the study of variabilities can provide information about OB stars which cannot otherwise be obtained. The topics covered included the modeling of stellar atmospheres, chaos, driving mechanisms, the interaction between NRP and rotation, and the connection between stellar evolution and pulsation.

Thirty-three poster papers were shown during two poster sessions. Together with the ten orally presented contributed papers, they brought the ratio of papers to participants relatively close to the ideal (provided neither number is too large) value of unity.

Upon invitation by the SOC, A.G. Hearn, J.M. Marlborough, and J.R. Percy gave brief, personal summaries of the workshop. Apart from rounding off the workshop, their remarks were also intended as nuclei for the special discussion session in the morning of Thursday, October 18. The SOC had asked participants ahead of time whether they would be interested in a more extensive discussion which, contrary to the other sessions, *would not be recorded* in the proceedings. In fact, nearly two-thirds of the participants came and a lively discussion developed. The inherent risk of a session without predefined agenda

was ably compensated by the careful chairmanship of C.T. Bolton. So, the obvious advantage of this concept, namely to re-assess the main topics in a broader context after all observed facts and inferred arguments had previously been put on the table, could be fully exploited. A general consensus seemed to be that the main problems are now seen much more clearly. A very encouraging observation was that in spite of the necessarily controversial character of the discussion, participants tried very constructively to identify the areas of agreement. These may be larger than could realistically be expected before the workshop: Nonradial pulsations are the most widespread phenomenon. But there are certain phenomena which cannot in any straightforward way be explained by standard NRP eigenfunctions. In the co-rotating frame their phase velocity is very small, if not zero, but may nevertheless include velocity fields. Viable driving mechanisms of nonradial pulsations may be within reach.

Workshop participants have been asked to provide their manuscripts in camera-ready form by November 15. The proceedings will be published in the ESO Conference and Workshops Proceedings series and are intended to appear early in spring, 1991.

Many participants commented on the smooth organization of the workshop. It is my pleasure to pass these compliments on to those colleagues who actually deserve them: Hans-Jürgen Kraus, Harry Neumann, Britt Sjöberg, Rebonto Guha, Francesco Ferraro, to name only a few, and especially Christina Stoffer who gave an instructive example of Swiss precision.

ESO Exhibitions in a European Frame

This autumn, the ESO Exhibition visited the Council of Europe in Strasbourg, France, during sessions of the Council, as well as of the European Parliament. Following the festive opening on September 26 by the ESO Director General, Professor van der Laan, it was seen by a large number of delegates from most European countries in the course of the next 18 days. The exhibition was permanently manned by staff

from ESO and/or the Strasbourg Observatory (our thanks are due to the Director, Michel Crézé and his staff!) and the astronomers had plenty of opportunity to inform politicians and other specialists about what is going on in the Universe. Quite a few delegates from countries which are not members of ESO wanted to know why this is so. Who knows, perhaps some seeds have been sown in the minds of influential people!