Returning to the photo-emission studies we note that we are able to determine the surface electronic structure experimentally, and from intensity measurements we can establish symmetries and the orbital character of the states. These results must be compared with calculated surface energy bonds to check models. Such calculations are difficult and expensive for large surface unit cells and have so far for GaAs (001) been restricted to the non-existing, but calculable 2×1 reconstruction. There is, however, a good qualitative agreement between the measurements for the 2×4 reconstruction and the calculated surface bonds for the 2×1 dimer model illustrated in Fig. 7c. The dimer bond is found to have approximately the same binding energies (-3.5 eV $\leq E_i \leq -3.0$ eV) and $\vec{k}_{\parallel}$-values by both calculations and measurements, while states which are associated with broken bonds and bonds to Ga-atoms in the second layer, are found both theoretically and experimentally in the energy range -2.5 eV $\leq E_i \leq 0$ eV.

Conclusions

In this article we have shown how the combination of a UHV-based thin film growth technique (MBE) with ARPES and RHEED has provided unique opportunities for the study of a wide range of semiconductor surfaces and interfaces. The limitations of cleavage and ion bombardment are removed and the grown surfaces are free of damage and show precisely controlled composition. We have used the GaAs (001) – 2×4 reconstruction to illustrate the method. This surface cannot be reproducibly prepared by any other means.

In addition to evaluating the crystallographic and electronic structure of as-grown surfaces we have shown how RHEED can be used to study thin-film growth dynamics. Space does not permit the discussion of core level spectroscopy and interface studies, but they are readily incorporated into this general area, to the extent that surface and interface chemical effects are already being studied by measurements of core level binding energies and energy shifts, which can also provide information on the values of band edge discontinuities at semiconductor heterojunctions.

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Council Decisions

The EPS Council met in Berlin (West) on 22/23 March 1985 following meetings of the Executive Committee and various advisory committees, reports on which will be given in the May issue of *Europhysics News*. Coincidentally, the 5th EPS General Condensed Matter Physics Conference was being held at the Technical University during which generous exposure was given to EPS, and participants not yet IOMs were urged to add their weight to the Society.

Decisions taken by the Council included: the election of the Executive Committee for 1985/86 which took office immediately after the Council meeting; the changes to the Constitution and By-laws to cater more effectively for the suspension of members who do not pay their annual fees, and the provision of a reduced membership fee for young physicists (below 30 years of age) as well as retired physicists (already agreed). The relevant articles and rule are cited overleaf.

Council by a large majority also empowered the Executive Committee to raise the unit fee from the beginning of 1986 from its present value of Sw.Fr. 10.– to Sw.Fr. 11.–. The last rise took place at the beginning of 1983 and Council has in the past approved the principle that the unit fee should, in general terms, keep pace with Swiss inflation, as this represents the increase in much of the Society's expenditure. Although inflation in Switzerland tends to rise more slowly than in most European countries, the yearly rate is rarely below 3% and in 1985 has been running at nearly 10%. The three-year figure, 1983-85, is thus likely to be well over the 10% mark.

Executive Committee 1985/86

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J. Kaczer, Prague
G. Preparata, Bari