

Experimental Verification

Test amplifiers using glass edge absorbers have been successfully operated at LLNL, but not with sufficient light intensity or pulse frequency to test severely the validity of this design model. Although no thermal stress failure has been observed for the imposed light intensities, estimated to be low, and pulse frequencies up to 100 Hz, these results are not considered sufficient to validate application of the model in edge cladding design.

Concluding Remarks

A one-dimensional cyclic quasi-steady conduction problem for an arbitrary internal heat generation function has been solved and the solution used to predict the temperature and thermal stress distributions in the edge cladding of a solid-state laser slab. The results of analysis show that:

- 1 The thermal stress variations in the cladding, for a given pulse frequency and absorption parameter $\alpha_p L$, can be minimized by selecting proper absorptivity of the cladding material.
- 2 An approximate relationship between pulse frequency

and absorptivity corresponding to the minimum thermal stress variation is reliable at pulse frequencies less than 250 Hz.

References

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ERRATUM

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Many of us (see, e.g., Ramilison and Lienhard, 1987, "Transition Boiling Heat Transfer and the Film Transition Regime," *JOURNAL OF HEAT TRANSFER*, Vol. 109, No. 3, pp. 746-752) have credited an important discovery to the wrong authors. This was the discovery that the surface temperature of certain ostensibly surface-temperature-controlled boiling heaters is actually strongly dependent on the local heat flux. We have referred to G. Hesse (1973, "Heat Transfer in Nucleate Boiling, Maximum Heat Flux and Transition Boiling," *Int. J. Heat Mass Transfer*, Vol. 16, pp. 1611-1627), who detailed the phenomenon and attributed it to work in the late sixties by Stephan, Kovalev, Grassman, and Ziegler.

Actually, E. Adiutori (1964, "New Theory of Thermal Stability in Boiling Systems," *Nucleonics*, Vol. 22, No. 5, pp. 92-101) clearly diagnosed this experimental shortcoming, and he followed it up with more specifics in a letter published in the Dec. 1964 issue of *Nucleonics*. This was before any of Hesse's sources were published. To the best of my knowledge, Adiutori should be credited with discovering this subtle influence.