the solution surface with some other prescribed surface $X = f(S, t)$. For the TCT method this surface is a plane inclined to the $t = 0$ plane. The NIVP, of course, is a variant of Cauchey's problem with the time coordinate being treated as a semi-infinite space coordinate.

In principle, the calculation for the NIVP can proceed as in the classic case except that the starting time depends upon space. The NIVP method could thus incorporate asynoptic data from sources other than satellites. In some simple cases, it is possible to handle the warping of the initial time boundary by the same techniques that are used for irregular spatial boundaries in ocean circulation models.

As pointed out by both Halberstam and Holmström, considerably more work on this approach is necessary if it is to become a useful tool in forecasting.

Reply to A. D. Kirwan

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When suggesting the method for "four-dimensional data asimilation" I had not heard of Dr Halberstam's work and I am very glad for the comment above which indicates that we independently have had the same idea. As a result of my note I have now had the opportunity to read Dr Halberstam's interesting thesis and find it surprising that a shorter version of it has not yet been published as an article in any of the well known journals of meteorology.

REFERENCES

Halberstam, I. M. 1972. Asynoptic meteorological data assimilation by means of a time-coordinate transformation. PhD dissertation, New York University, New York 10003, New York.

Holmström, J. 1973. On four-dimensional-a-dat assimilation. *Tellus 25*, 525.