

K18(G73)

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Proposal Abstract K18(G73)

1. **Arms Control Problem:**  
Nuclear weapons - comprehensive test ban
2. **Verification Type:**
  - (a) Seismic sensors - extra-border stations  
- international network
  - (b) International exchange of information
3. **Source:**  
Canada. "The verification of a comprehensive test ban by seismological means". CCD/406, 10 July 1973.
4. **Summary:**

The paper reviews the status of Canadian seismic research and discusses existing uncertainties in seismic verification. It comes to the following conclusions, amongst others:

  - (1) There is a 90% chance of applying seismic discrimination techniques to events as low as body wave magnitude  $m_b$  4.5 (5-10 kt in hard rock assuming no evasion).
  - (2) The current teleseismic limit for positive identification in rock is about 2 to 4 kt. Thus other operational verification techniques need practical consideration including on-site inspection.
  - (3) Ignoring evasion possibilities, the rate of false alarms using purely seismological methods depends upon the operational methods adopted, the discrimination limit of the deployed network and a policy decision about what constitutes adequate deterrence.
  - (4) The provision of seismic data from all Eurasian states would enable progress to be made on the residual false alarm problem.
  - (5) Currently, a multi-step discriminant approach to an operational verification scheme involving multinational cooperation between advanced national facilities appears to provide an attractive way to monitor underground nuclear explosions and could be developed for the purpose of a CTB.
  - (6) As seismic limits are reached more emphasis will be necessary on cost-effective seismic array monitors using small scale digital processors and on devising optimum methods of verification.