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Abstract: The addition of stellar guidance to a **submarine** launched ballistic missile (SLBM) system imposes special computational requirements on the fire control system. In general, the stellar guidance algorithms use the observable misorientations of the guidance inertial platform derived from an inflight star sighting and a statistical representation of the weapon system errors to obtain an estimate of the errors in guidance computed state vector (i.e., position, velocity, and inertial platform misorientation). In practice, these errors are estimated by the application of a precomputed gain matrix to the sighting information. The computation of this gain is a fire control responsibility. The improvement in weapon system accuracy achievable through incorporation of this stellar inertial guidance scheme is dependent on the orientation of the guidance inertial platform, i.e., the star to be sighted. An additional fire control task, therefore, is the selection of a star (from a catalog of stars) which enhances the observability of system errors and restricts the propagation of non-observable system errors. The implementation of algorithms to perform these tasks in a time constrained environment is the subject of this paper. (Author)

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