

# Influence Determination of the Special Liquid Fuel's Physical-chemical Parameters Over the Dynamic Behavior of Surface-to-air Missiles

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*Abstract* — In the Research and Flight Test Center was developed an instrumentation solution for SAM type 5Ia23 Volhov, which provides a telemetry data link between onboard equipments, mounted on the missile, and a ground station. Using this instrumentation solution was possible to collect the necessary data for a quantitative and qualitative determination of the influence of the special liquid fuel's physical-chemical parameters, used in reactive engine with liquid fuel's (RELF) powering, over the dynamic behavior of surface-to-air missiles (SAM) type 5Ia23 Volhov, in order to evaluate their operational performances. To be mounted onboard of SAMs the instrumentation solution had to be validated. This process involved completing a complex ground and flight test program. The ground tests were performed to check, on the one hand, the electromagnetic compatibility between communication system equipment of the instrumentation configuration mounted onboard of the missiles and their safety system components, including the specific SAMs firing environmental electromagnetic condition found only in the polygon Capu-Midia, and on the other hand, the functionality of data link on the estimated flight range of the missiles. Dynamic testing was performed through real firings which were executed with two instrumented SAMs type 5Ia23-Volvov. Both firings were executed according with the normal operational firing procedures, on an imitated target which was placed on the middle axe of the firing area of the polygon, in specific initial conditions.