

Design for Harsh Environments

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Often in the MS instrumentation community it is common to develop new systems as proof-of-concepts or rapid prototypes in order to demonstrate a new advance in technology. An unnecessarily large fraction of such new systems fail during the technology transfer process due to factors unrelated to the new technology. Yet end-users unfamiliar with the technology tend to view the technology itself as a failure. This talk will review some basic design concepts to consider at the onset of prototype development that can mitigate risks of reduced performance, or failure, in the field. Topics include reviews of design best practices for electrical, mechanical, fluid, and material system aspects. Additional topics will focus on human factors issues such as- ease of operation (especially by non-experts), ease of maintenance, and damage mitigation.