Shuttle Hypervelocity Impact Database

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With three flights remaining on the manifest, the shuttle impact hypervelocity database has over 2800 entries. The data is currently divided into tables for crew module windows, payload bay door radiators and thermal protection system regions, with window impacts compromising just over half the records. In general, the database provides dimensions of hypervelocity impact damage, a "component level" location (i.e., window number or radiator panel number) and the orbiter mission when the impact occurred. Additional detail on the type of particle that produced the damage site is provided when sampling data and definitive analysis results are available.

The paper will provide details and insights on the contents of the database including examples of descriptive statistics using the impact data. A discussion of post flight impact damage inspection and sampling techniques that were employed during the different observation campaigns will be presented.

Future work to be discussed will be possible enhancements to the database structure and availability of the data for other researchers. A related database of ISS returned surfaces that are under development will also be introduced.