URL: http://cxc.harvard.edu/sherpa3.4/bugs/ut_projection.html
Last modified: 21 September 2006

Utility Bugs: projection

Bugs

1. ***PROJECTION* and *REGION−PROJECTION* do not recognize the parameters by number.**

   They must be specified as `model_name.param_name`, not `model_name.param_number` (e.g. `PROJECTION poly.c0` vs `PROJECTION poly.1`).
2. ***Projection fails with "Error: LM Error has been detected."***

```
sherpa> projection
Error: LM Error has been detected.
  -- The LM alpha matrix is null.
  -- ==> bad parameter value choices.
```

One cause is parameter step size at parameter bounds. For instance, the default step size for a Gaussian fwhm is 0.01 times the current value; if the value hits its hard minimum (approximately 10^−38) during projection, then the step size will not be large enough to cause the statistic to change, leading to a null alpha matrix.

Workaround:

S−Lang could be used to avoid this problem:

```
sherpa> tryone = run_proj(["pow1.ampl"])
sherpa> print(tryone)
NULL
```

If NULL, then change the optimization method to powell and try again:

```
sherpa> () = sherpa_eval("method powell")
sherpa> sherpa.proj.fast = 0
sherpa> trytwo = run_proj(["pow1.ampl"]);
Projection complete for parameter: pow1.ampl

Computed for sherpa.proj.sigma = 1.6
        ------------------------------------------------------------
        Parameter Name Best-Fit Lower Bound Upper Bound
        ------------------------------------------------------------
          pow1.ampl 5.33519e-06 -1.24361e-06 +1.24361e-06

sherpa> print(trytwo[0])
name = pow1.ampl
val = 5.33519e-06
vlo = 4.09157e-06
vhi = 6.5788e-06
sigma = 1.6
```

Then change back to LM, if desired.

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