



Utility Bugs: region-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. **Region-projection fails with "Error: The LM alpha matrix is null."**

```
sherpa> region-projection model.param2 model.param3
Region-Projection: computing grid size with covariance...done.
Error: 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_regproj(["model.param2", "model.param3"])
sherpa> print(tryone)
NULL
```

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

```
sherpa> () = sherpa_eval("method powell")
sherpa> sherpa.regproj.fast = 0

sherpa> trytwo=run_regproj(["model.param2", "model.param3"])
done.
           outer grid loop 20% done...
           outer grid loop 40% done...
           outer grid loop 60% done...
           outer grid loop 80% done...

Minimum: 0.0707442
Levels are: 2.36674 6.25174 11.9007

sherpa> print(trytwo)
x0          = Double_Type[100]
x1          = Double_Type[100]
y           = Double_Type[100]
levels      = Double_Type[3]
name        = String_Type[2]
```

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```
bfit          = Double_Type[2]  
config       = sherpa_VisParEst_State
```

Then change the method back to LM, if desired.

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URL:
http://cxc.harvard.edu/sherpa3.4/bugs/ut_regproj.html
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