

Community Atlas of Stellar Streams

```
1 begin
2     using Pkg; Pkg.activate("../")
3     using IntrospectiveStreams
4     using CSV
5     using DataFrames
6     using CairoMakie
7 end
```

Activating project at `~/julia/dev/IntrospectiveStreams`



true

```
1 Makie.inline!(true)
```

Searching the streams at first order

Here we show the result of making approximate cuts in proper motion (PM) and color-magnitude (CM) for the five streams using Gaia DR3. We also show the case of GD-1 with DR2 for comparison. The PM cut is guided by the Galstream track: $\mu^{(t)}$. The filtering is done by keeping only stars that satisfy: $\forall \phi_1 : |\mu_1^{(*)} - \mu_1^{(t)}(\phi_1^{(*)})| < 0.7$ and $\forall \phi_1 : |\mu_2^{(*)} - \mu_2^{(t)}(\phi_1^{(*)})| < 0.7$ where $\mu_{1,2}$ are the PMs not corrected by the solar reflex-motion, and \star denotes the Gaia data. The process is performed by the function "example" given below. There you can see the input parameters used for age, metal, σ_c (width in color) and σ (width in PM).

```

1 begin
2   name_s = ["GD-1", "GD-1", "Pal5", "Jhelum", "Fjorm-M68", "PS1-A"]
3   name_t = ["GD-1-PB18", "GD-1-PB18", "Pal5-PW19", "Jhelum-b-B19", "M68-P19",
4             "PS1-A-B16"]
5   age     = [12.0, 12.0, 12.0, 12.0, 11.2, 12.0]*10^9 #yr
6   metal   = [-1.5, -1.5, -1.4, -1.2, -2.2, -1.7]
7   filters = fill("UBVRiplus", length(name_s))
8   dr      = fill("DR3", length(name_s))
9   dr[1]   = "DR2"
10  tol_curation = [0.3, 0.3, 1.0] # tolerances in  $\mu_\alpha \cos \delta$ ,  $\mu_\delta$ ,  $\Pi$ .
11  col_bounds = (-1.0, 4.0)
12  box_μ = [[-14, -10.], [-4., -2.]]
13  σ_c = 1
14  σ = 0.7
15
16  file_orig, file_corr, file_phot, file_iso, file_filt, file_plot =
17    name_files_all(dr, name_s, age, metal)
18  nothing
19 end

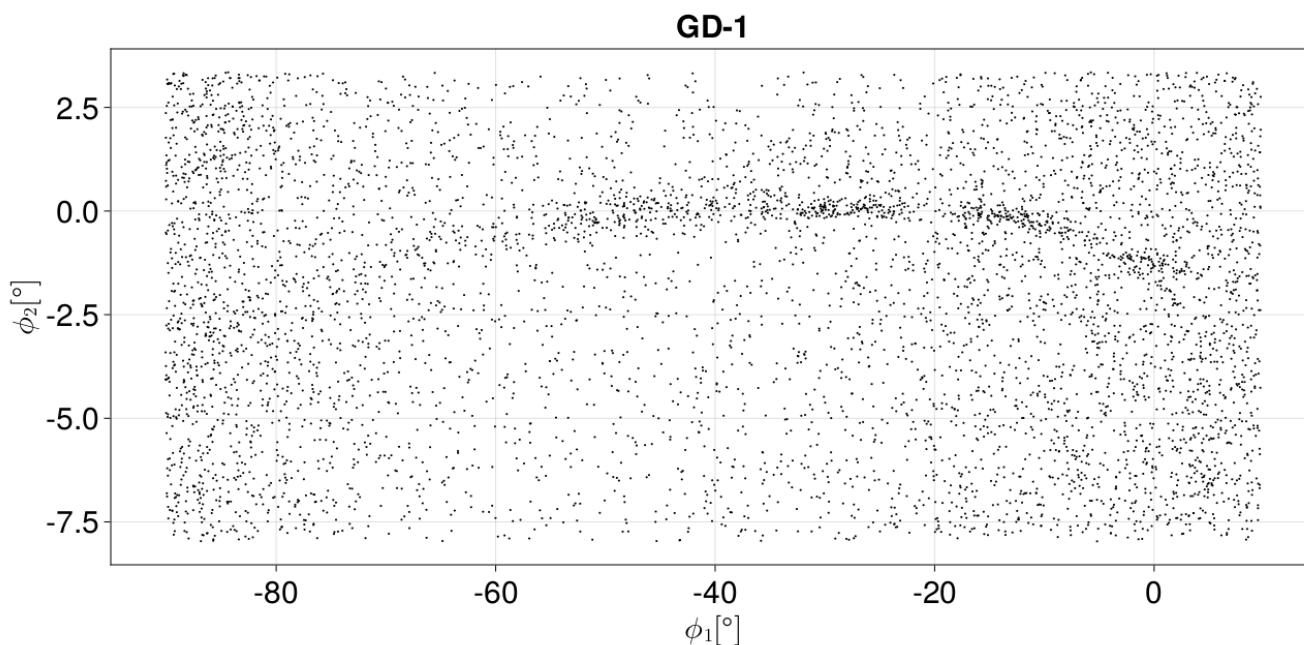
```

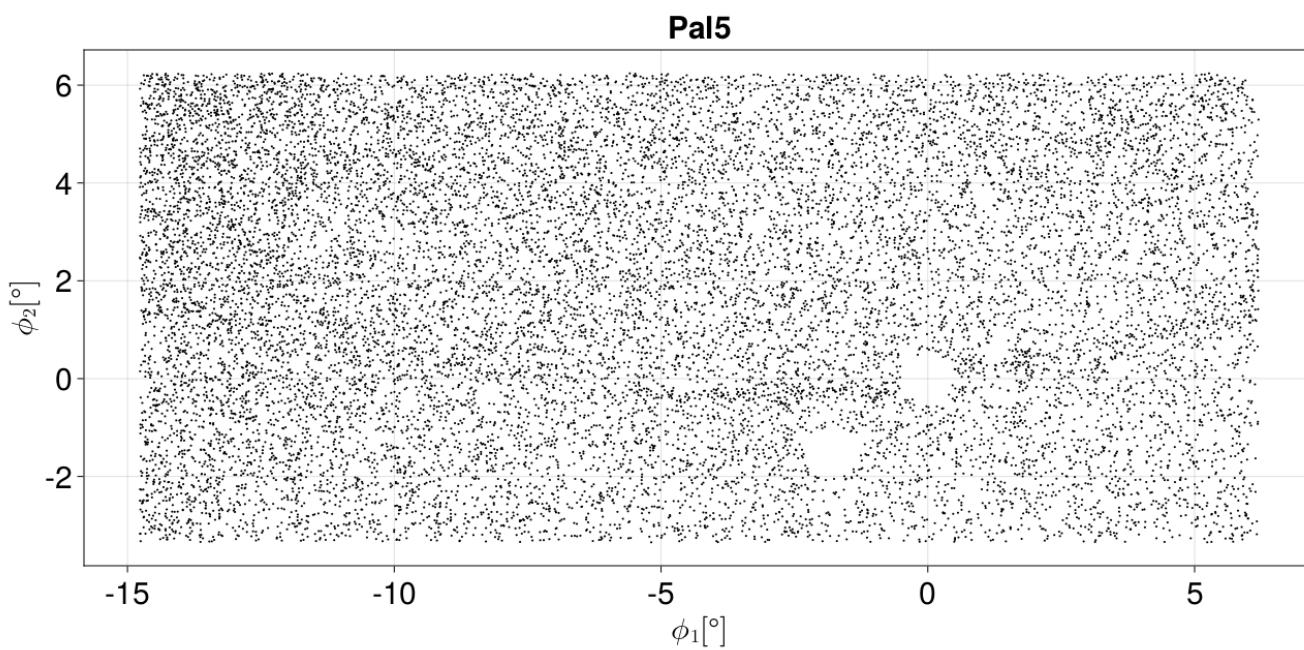
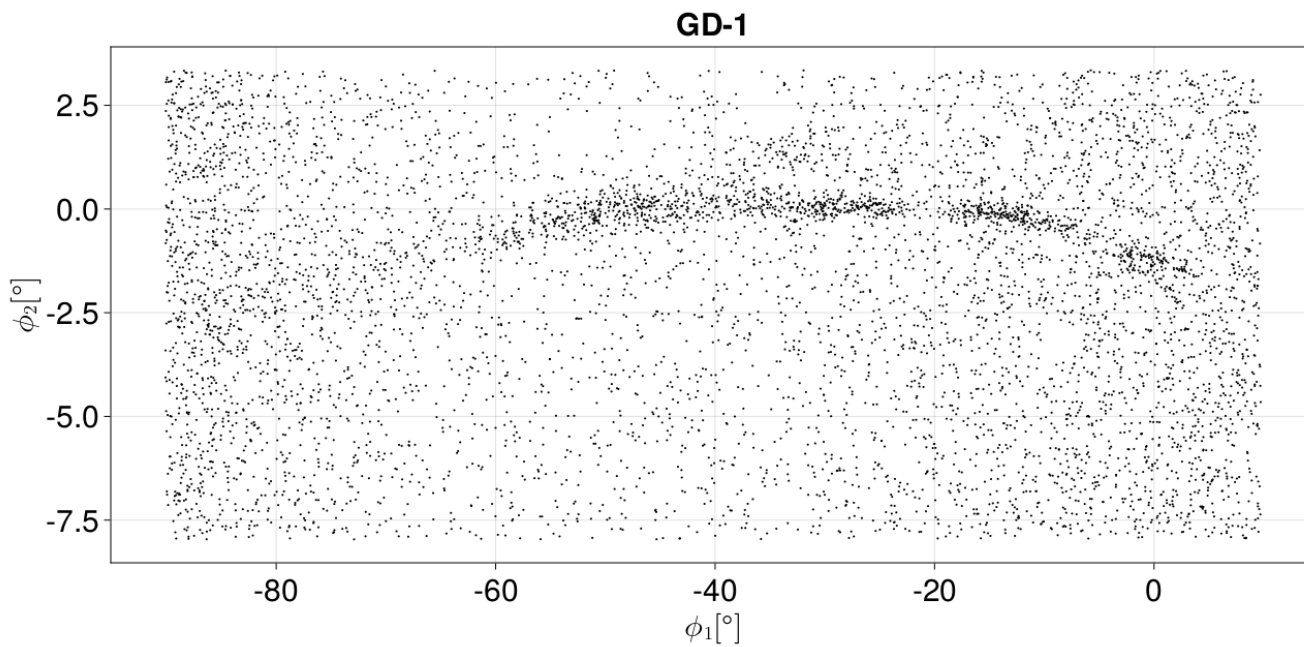
Now lets reopen the filtered files and display the plots without the tracks so as not to cheat the eye.

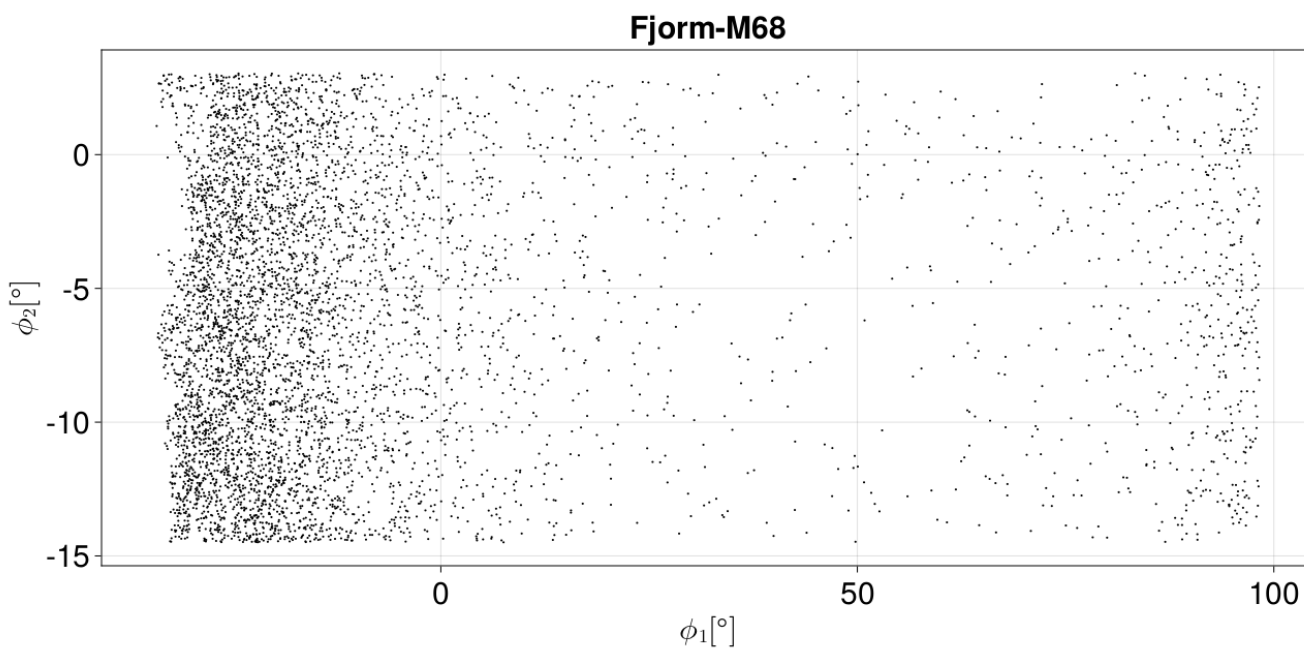
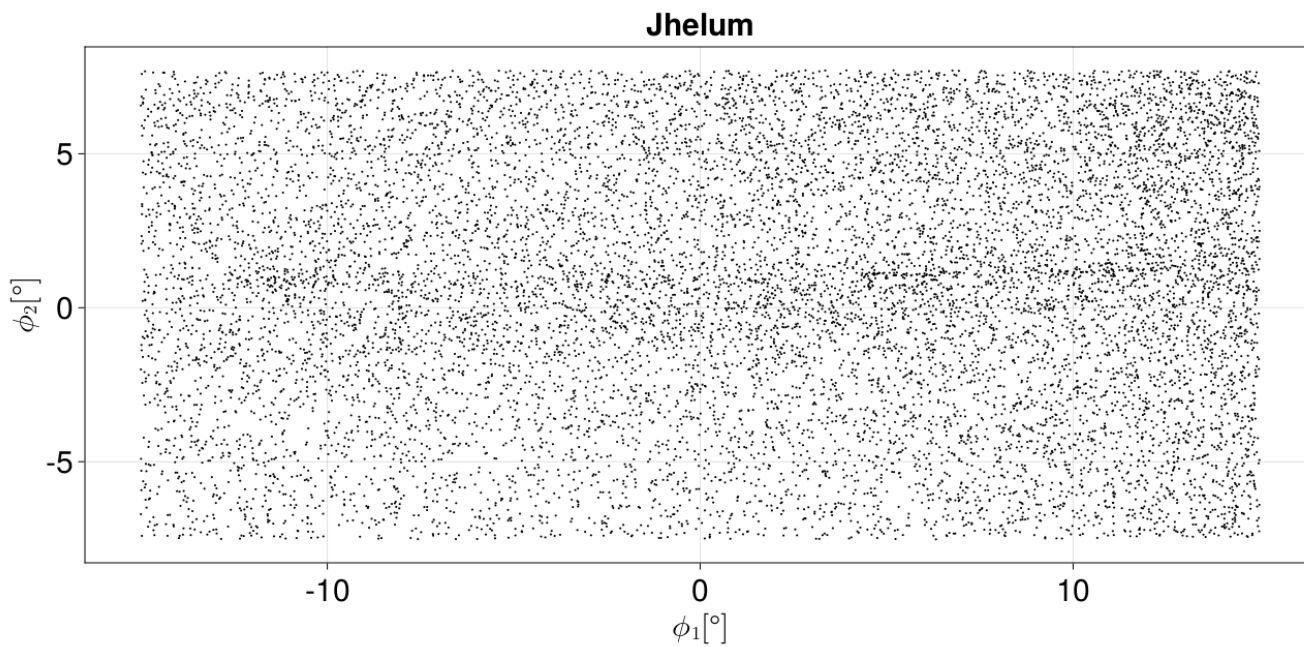
```

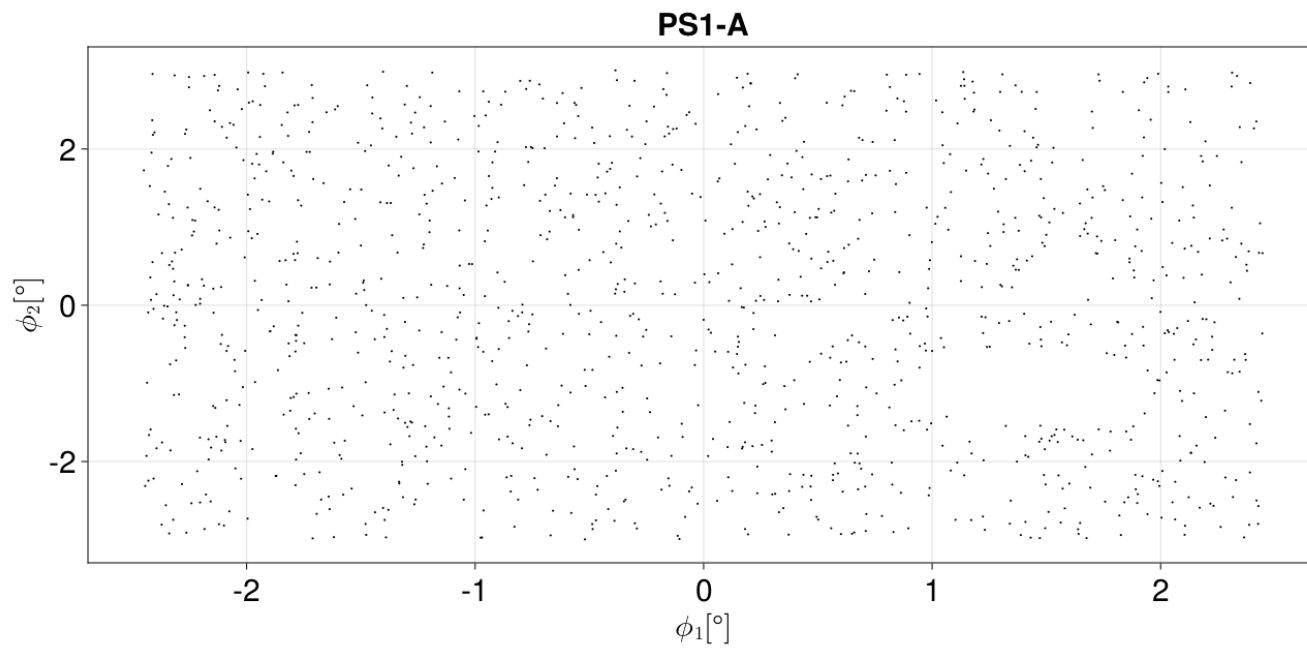
1 begin
2   figs = Vector{Figure}(undef, length(name_s))
3   for i ∈ eachindex(name_s)
4     df = DataFrame(CSV.File(file_filt[i], delim=",", ignorerepeated=true))
5     figs[i] = plot_scatter_on_sky_self_frame(name_s[i], df, file_plot[i])
6   end
7 end

```









```

1 begin
2     figs_t = Vector{Figure}(undef, length(name_s))
3     for i ∈ eachindex(name_s)
4         df = DataFrame(CSV.File(file_filt[i], delim=",", ignorerepeated=true))
5         df_track, self_frame = load_stream_track(name_t[i])
6         figs_t[i]=plot_scatter_on_sky_self_frame(name_s[i], df, df_track,
            file_plot[i])
7     end
8 end

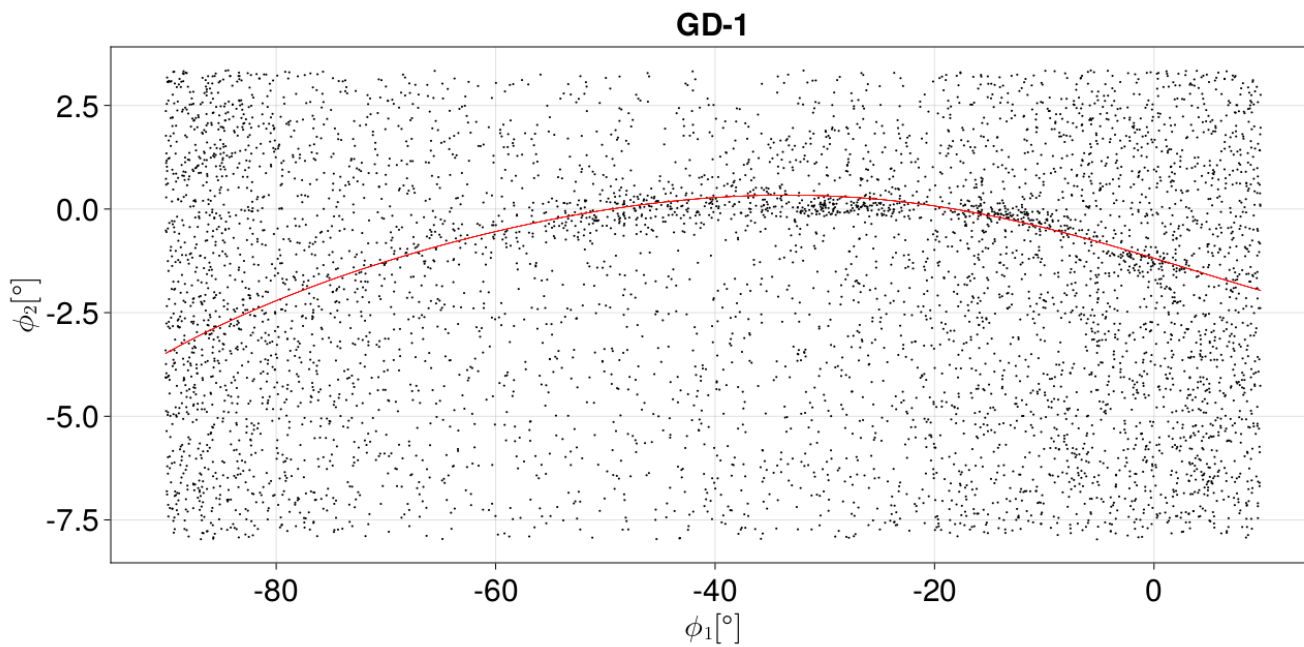
```

```

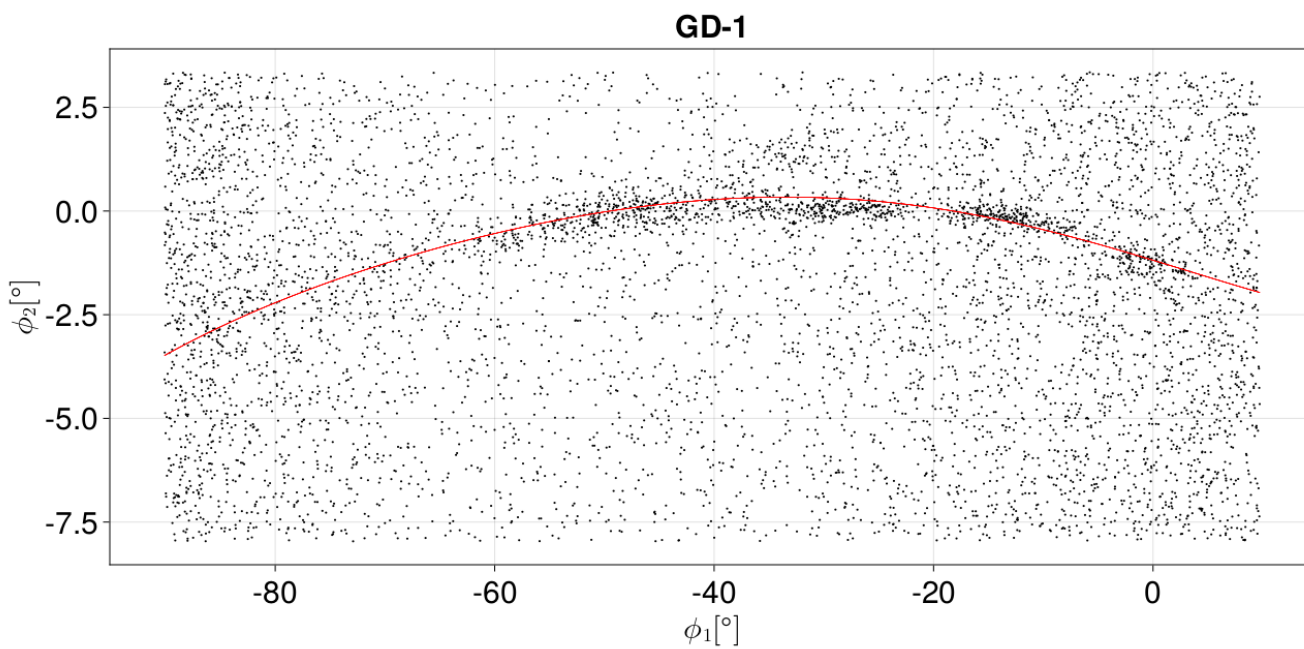
WARNING: AstropyDeprecationWarning: The matrix_product function is deprecate
ed and may be removed in a future version.
    Use @ instead. [gala.coordinates.greatcircle]
WARNING: AstropyDeprecationWarning: The matrix_product function is deprecated
and may be removed in a future version.
    Use @ instead. [gala.coordinates.greatcircle]
WARNING: AstropyDeprecationWarning: The matrix_product function is deprecated
and may be removed in a future version.
    Use @ instead. [gala.coordinates.greatcircle]
WARNING: AstropyDeprecationWarning: The matrix_product function is deprecated
and may be removed in a future version.
    Use @ instead. [gala.coordinates.greatcircle]
WARNING: AstropyDeprecationWarning: The matrix_product function is deprecated
and may be removed in a future version.
    Use @ instead. [gala.coordinates.greatcircle]
WARNING: AstropyDeprecationWarning: The matrix_product function is deprecated
and may be removed in a future version.
    Use @ instead. [gala.coordinates.greatcircle]
WARNING: AstropyDeprecationWarning: The matrix_product function is deprecated
and may be removed in a future version.
    Use @ instead. [gala.coordinates.greatcircle]
WARNING: AstropyDeprecationWarning: The matrix_product function is deprecated
and may be removed in a future version.
    Use @ instead. [gala.coordinates.greatcircle]
WARNING: AstropyDeprecationWarning: The matrix_product function is deprecated
and may be removed in a future version.
    Use @ instead. [gala.coordinates.greatcircle]
WARNING: AstropyDeprecationWarning: The matrix_product function is deprecated
and may be removed in a future version.
    Use @ instead. [gala.coordinates.greatcircle]

```

Now lets plot together with the tracks.



```
1 figs_t[1]
```



```
1 figs_t[2]
```

