2 Symmetric space

2a. Sphere model

Not discussed in the present version of rFtm.

It consists of the pairs (w_1, w_2) of complex numbers with $|w_1|^2 + |w_2|^2 < 1.$

The action of g

```
In[ • ]:=   Clear[actB]
            actB[g_, {w1_, w2_}] := Block[{ww}, ww = g.{w1, w2, 1};
              ww = ww / ww〚3〛;
              Simplify[{ww〚1〛, ww〚2〛}]]
```

```
In[ • ]:= Clear[w1, w2]
          actB[wm, {w1, w2}]
```

Out[•]= $\{-w1, -w2\}$

```
In[ • ]:= (g = {{a11, a12, b1}, {a21, a22, b2}, {Conjugate[c1], Conjugate[c2], d}}) // MatrixForm
```

Out[•]//MatrixForm=
$$\begin{pmatrix} a11 & a12 & b1 \\ a21 & a22 & b2 \\ Conjugate[c1] & Conjugate[c2] & d \end{pmatrix}$$

```
In[ • ]:= actB[g, {w1, w2}]
          (Conjugate[c1] w1 + Conjugate[c2] w2 + d) % // Simplify
```

Out[•]= $\left\{ \dfrac{b1 + a11\ w1 + a12\ w2}{d + w1\ Conjugate[c1] + w2\ Conjugate[c2]}, \dfrac{b2 + a21\ w1 + a22\ w2}{d + w1\ Conjugate[c1] + w2\ Conjugate[c2]} \right\}$

Out[•]= $\{b1 + a11\ w1 + a12\ w2, b2 + a21\ w1 + a22\ w2\}$

```
In[ • ]:= (g /. {b1 → 0, b2 → 0, c1 → 0, c2 → 0}) // MatrixForm
```

Out[•]//MatrixForm=
$$\begin{pmatrix} a11 & a12 & 0 \\ a21 & a22 & 0 \\ 0 & 0 & d \end{pmatrix}$$