```
X[{θ_, ϕ_}] := {Cos[π/180 θ] Cos[π/180 ϕ], Sin[π/180 θ] Cos[π/180 ϕ], Sin[π/180 ϕ]};

Ortho[{x1_, y1_}, {x2_, y2_}] := Module[{θ1, ϕ1, θ2, ϕ2},
    {θ1, ϕ1, θ2, ϕ2} = π/180 {x1, y1, x2, y2};
    N[360 60/(2 π) ArcCos[Cos[θ1 - θ2] Cos[ϕ1] Cos[ϕ2] + Sin[ϕ1] Sin[ϕ2]]]
   ];

Graphe[{θ1_, ϕ1_}, {θ2_, ϕ2_}] := Module [{ρ, e, c, s, M, m, n},
   ρ = 0.3;
   {m, n} = {20, 10};
   e = Sqrt[(θ2 - θ1)^2 + (ϕ2 - ϕ1)^2, 2];
   {c, s} = {(θ2 - θ1)/e, (ϕ2 - ϕ1)/e};
   M := {{c, -s}, {+s, c}};
   Table[N[M.{e/m i, ρ e/m j} + {θ1, ϕ1}], {i, 0, m}, {j, -n, n}]]

AncreDep = {8.05, 47.3};
AncreArr = {226.88, -47.22};
Loc = Graphe[AncreDep, AncreArr];
{Maxi, Maxj, Coord} = Dimensions[Loc]
```

{21, 21, 2}

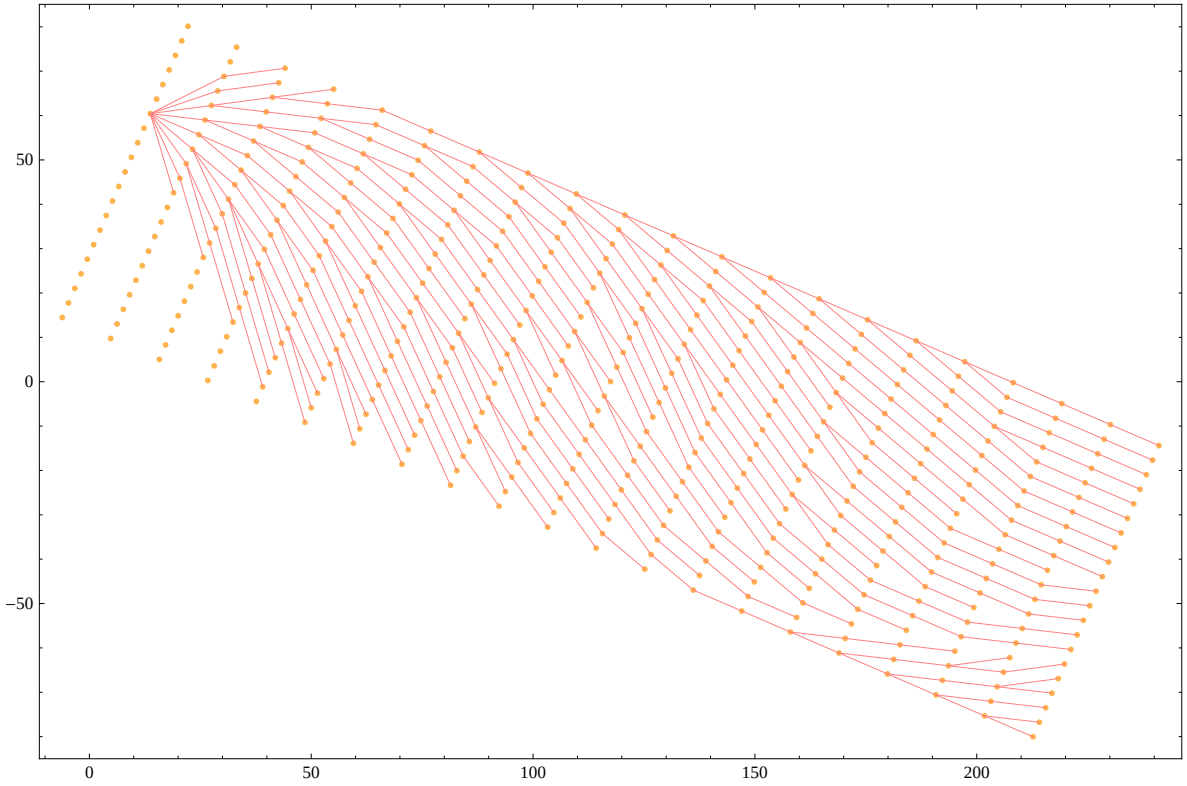
```
ProgrammationDynamique[Start_] := Module[{Spread, Graphe, ProgrDyn},
    Spread = 4;

    ProgrDyn[r_] := Module[{Etabli, Posi},
      Do[Etabli = Table[Graphe[[r - 1, j, 2]] + Ortho[Loc[[r - 1, j]], Loc[[r, k]]], {j, 1, Maxj}]; {{Posi}} = Position[Etabli, Min[Etabli]];
       If[Abs[k - Posi] ≤ Spread, Graphe[[r, k]] = {{{r - 1, Posi}, {r, k}}, Min[Etabli]}], {k, 1, Maxj}]
     ];

    Graphe = Table[{0, 10^6}, {i, 1, Maxi}, {j, 1, Maxj}];
    Graphe[[1, Start]] = {1, 0};
    Do[ProgrDyn[r], {r, 2, Maxi}];

    Transpose[Graphe]
  ]; (* Programmation Dynamique *)
Decision = ProgrammationDynamique[15];
```

```
G1 = Table[Graphics[{RGBColor[1, 0.7, 0.3], Point[Loc[[i, j]]]}], {i, 1, Maxi}, {j, 1, Maxj}];
G2 = Select[Flatten[Decision, 1], (Last[#] < 1000000) && (Last[#] > 0.1) &];
DimG2 = First[Dimensions[G2]];
G3 = Table[First[G2[[i]]], {i, 1, DimG2}];
G4 = Table[{Loc[[First[G3[[i]]][[1]], First[G3[[i]]][[2]]]], Loc[[Last[G3[[i]]][[1]], Last[G3[[i]]][[2]]]]}, {i, 1, DimG2}];
G5 = Table[Graphics[{RGBColor[1, 0.5, 0.5], Line[{G4[[i, 1]], G4[[i, 2]]}]}], {i, 1, DimG2}];
Show[G1, G5, Frame → True]
```



```
G6 = Table[{N[X[G4[[i, 1]]]], N[X[G4[[i, 2]]]]}, {i, 1, DimG2}];
G7 = Table[Graphics3D[{RGBColor[1, 0.5, 1], Line[{G6[[i, 1]], G6[[i, 2]]}]}], {i, 1, DimG2}];
Earth = Graphics3D[Sphere[{0, 0, 0}]];
Show[Earth, G7]
```