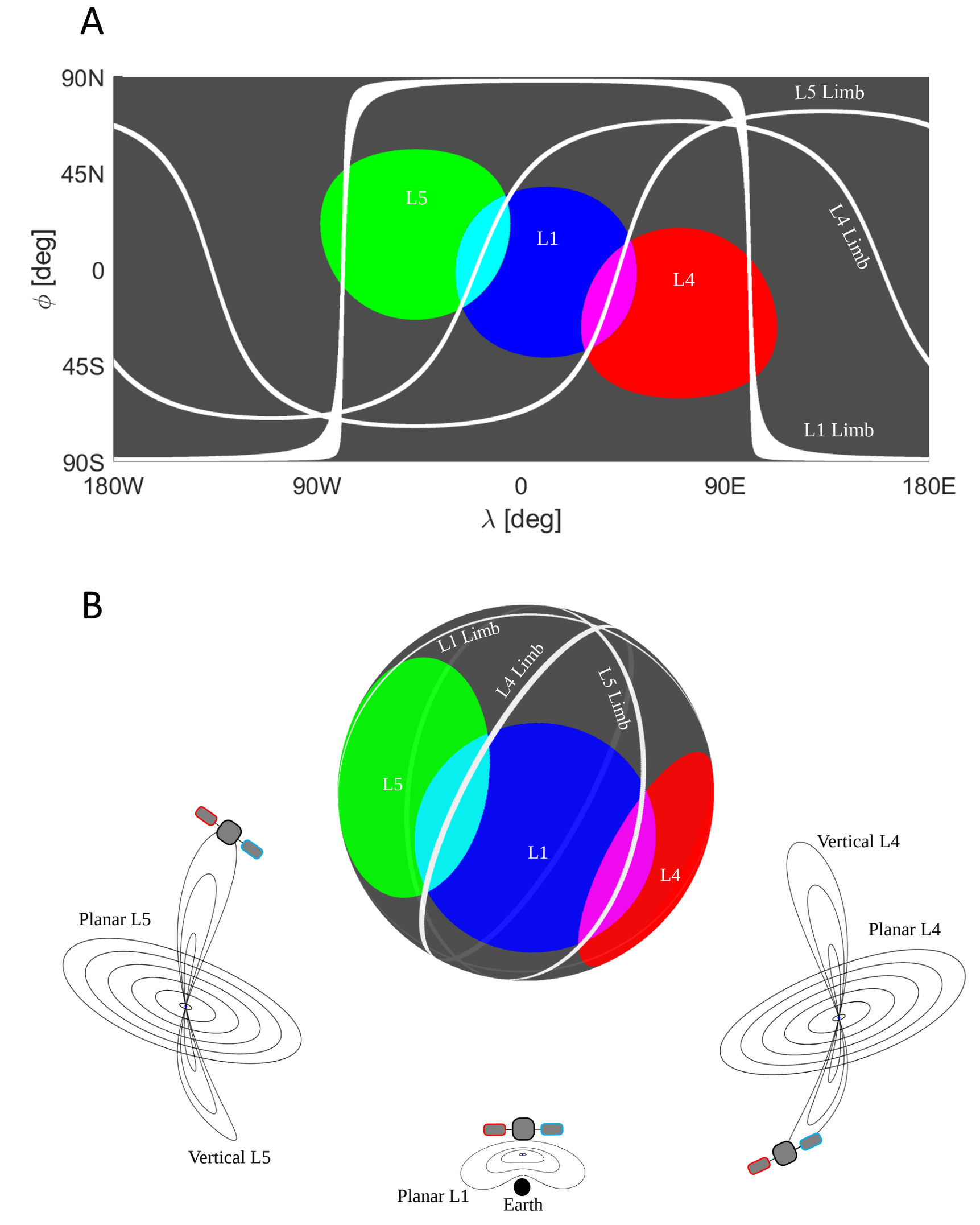
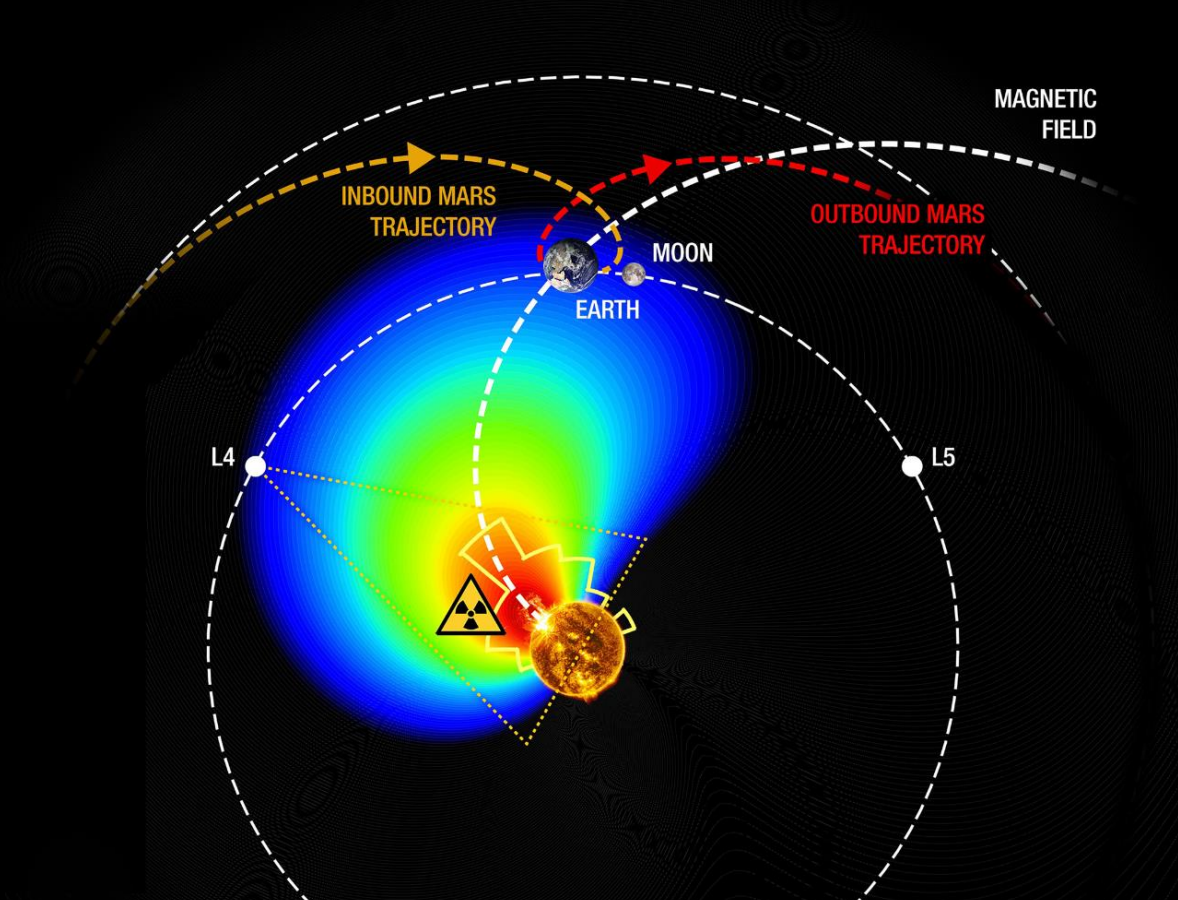
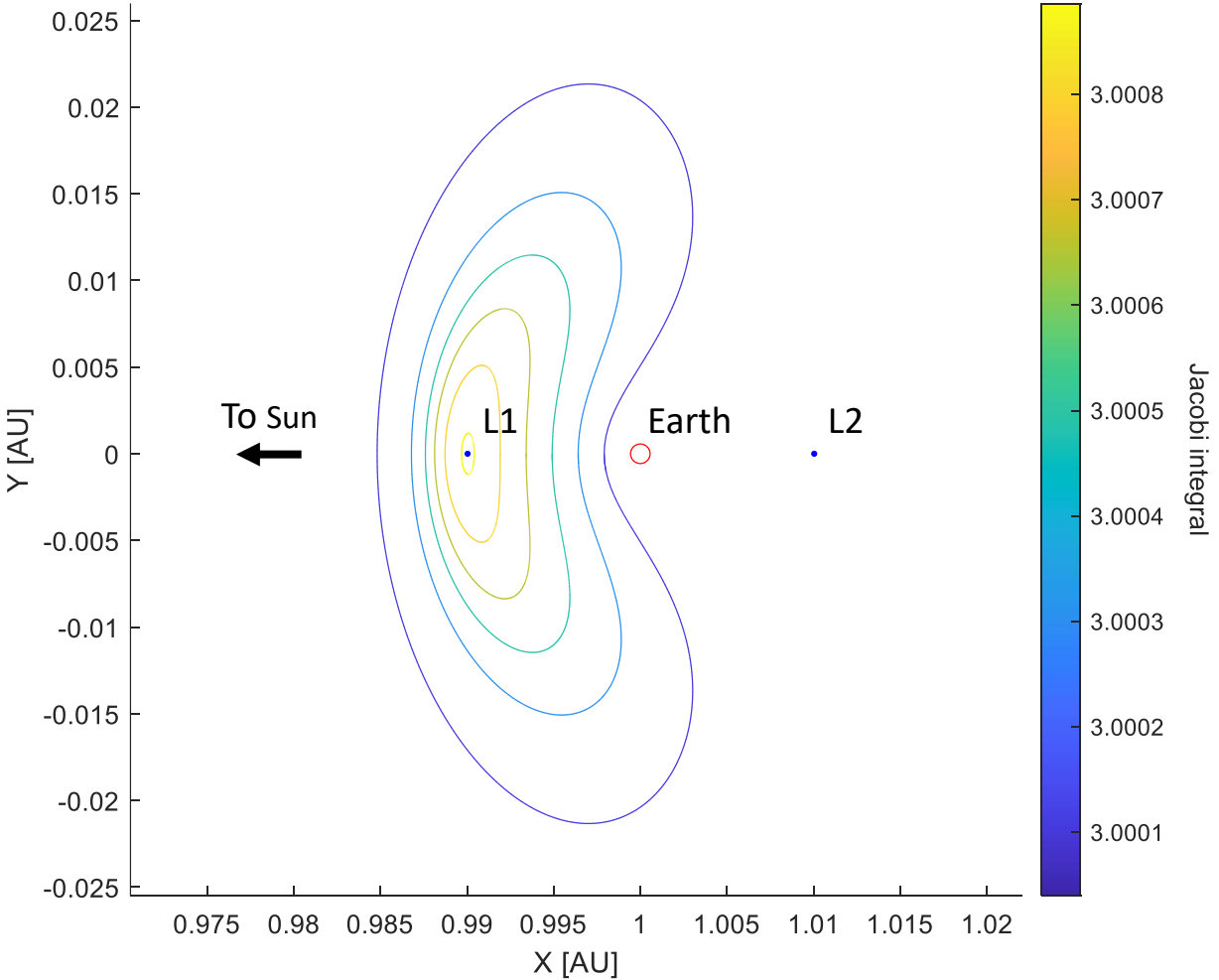
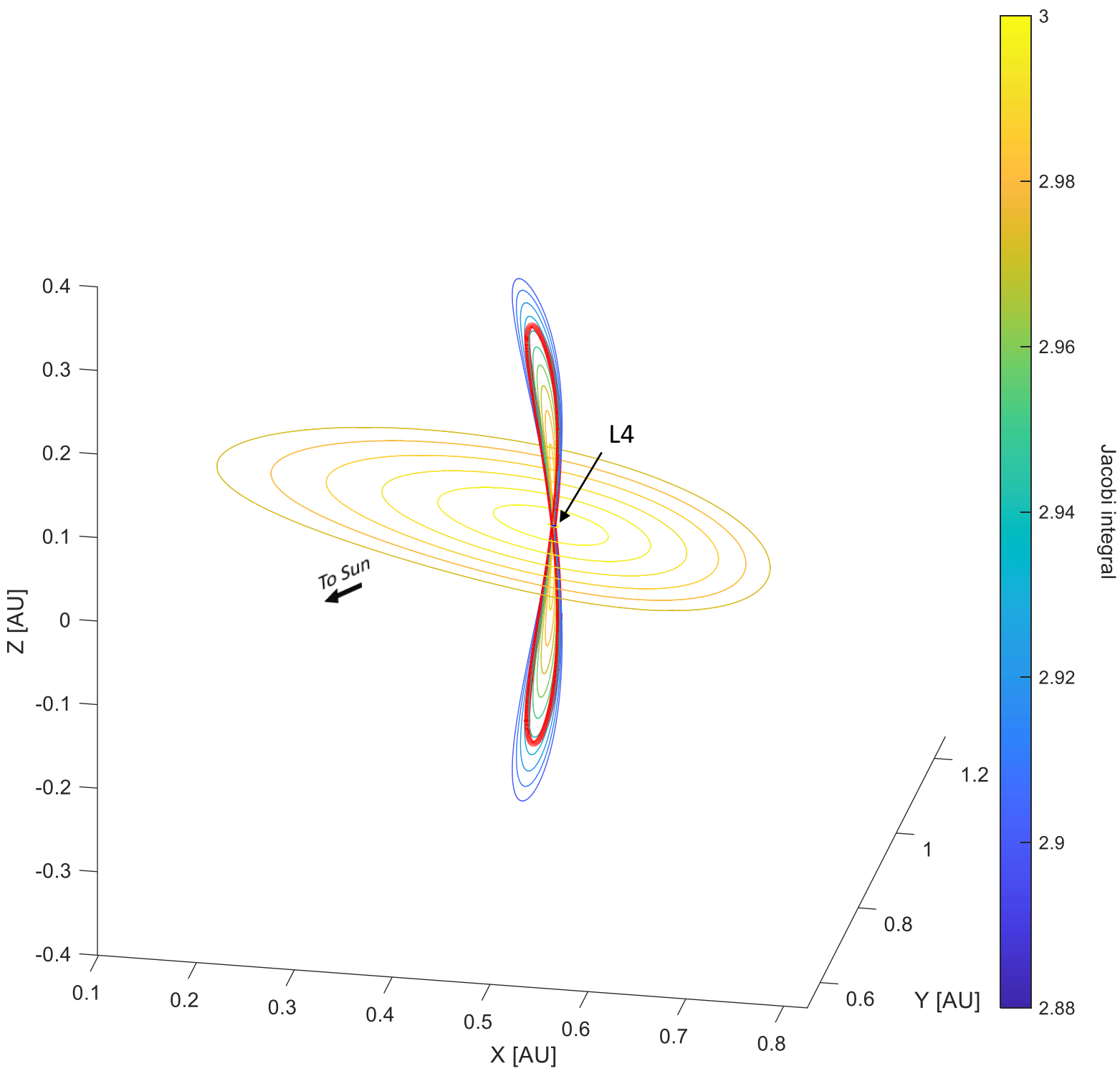
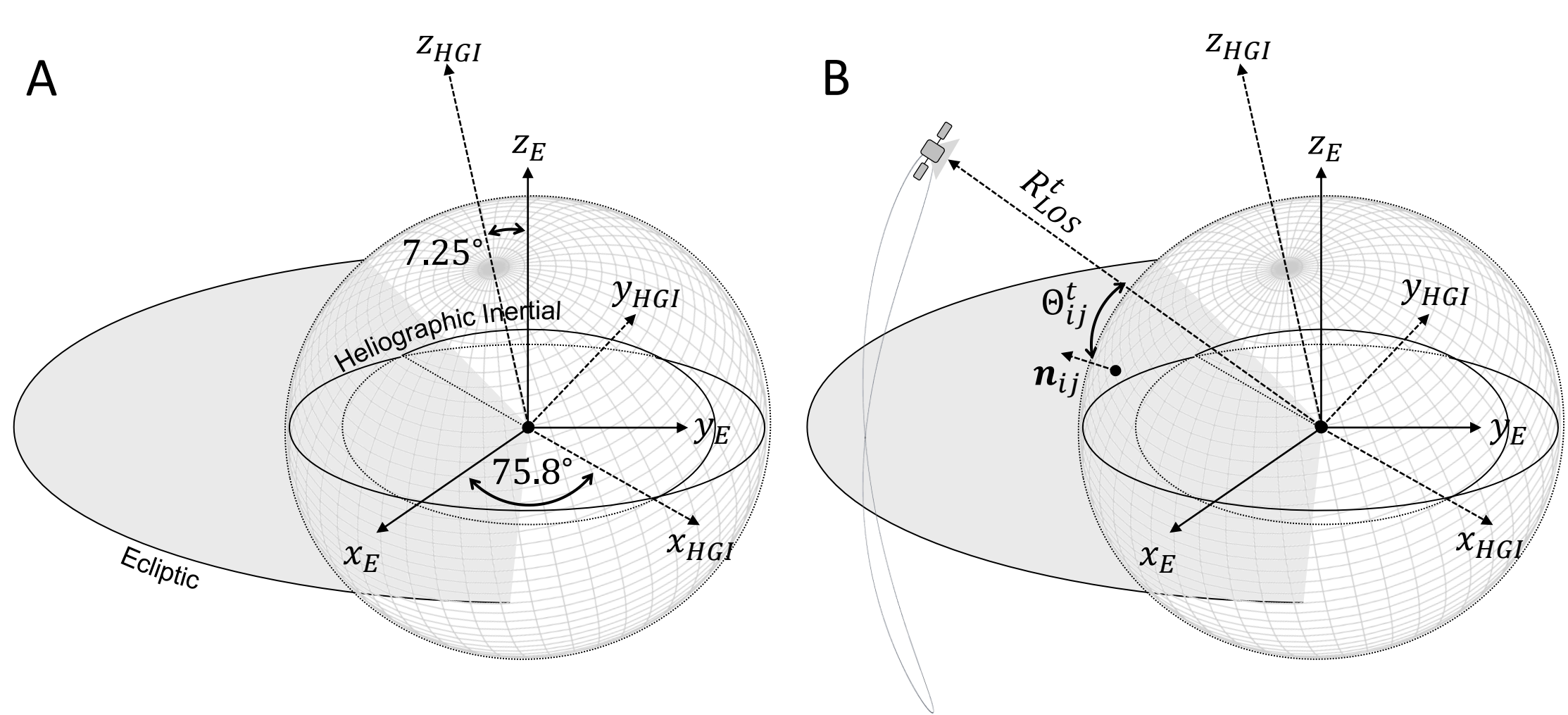
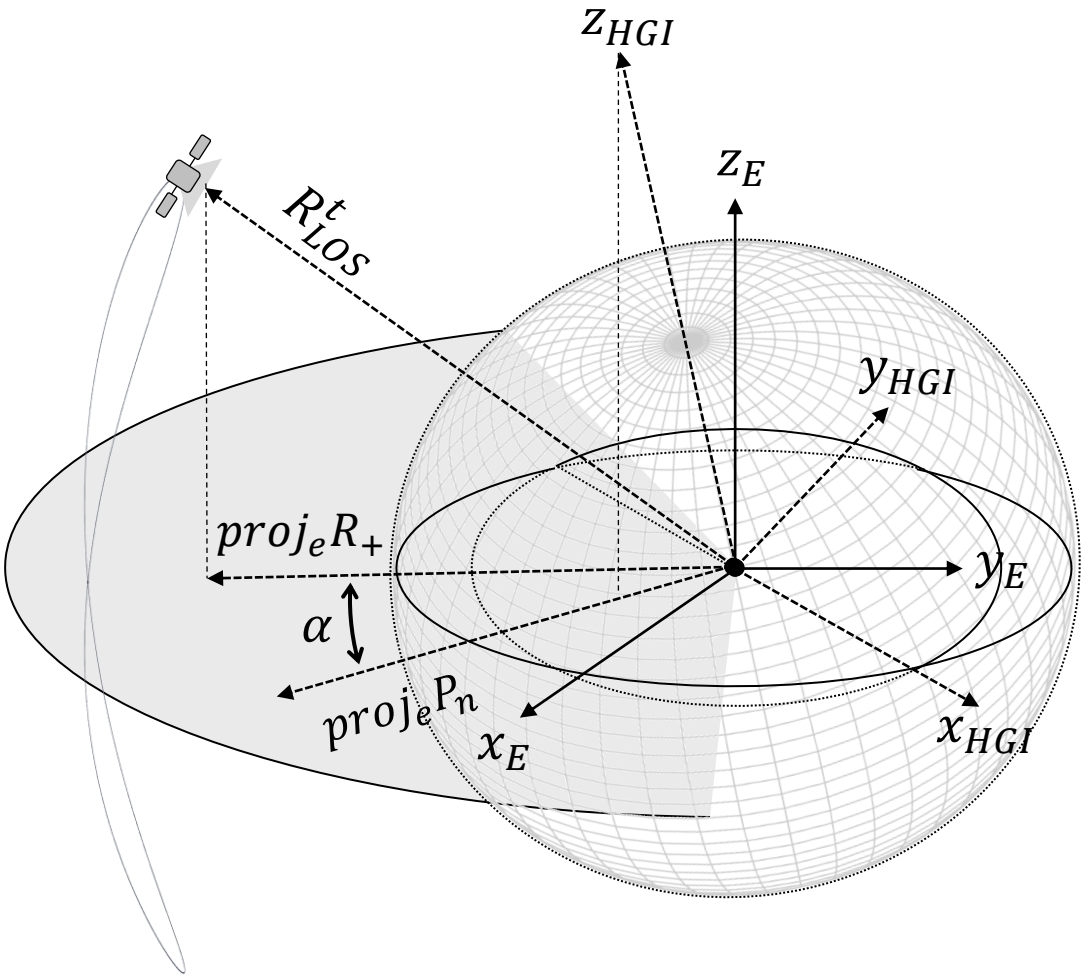

A
90N
45N
0
45S
90S
ϕ [deg]
180W
90W
0
90E
180E
λ [deg]
L5 Limb
L4 Limb
L1 Limb
L5
L1
L4
B
L1 Limb
L4 Limb
L5 Limb
L5
L1
L4
Planar L5
Vertical L5
Vertical L4
Planar L4
Planar L1
Earth

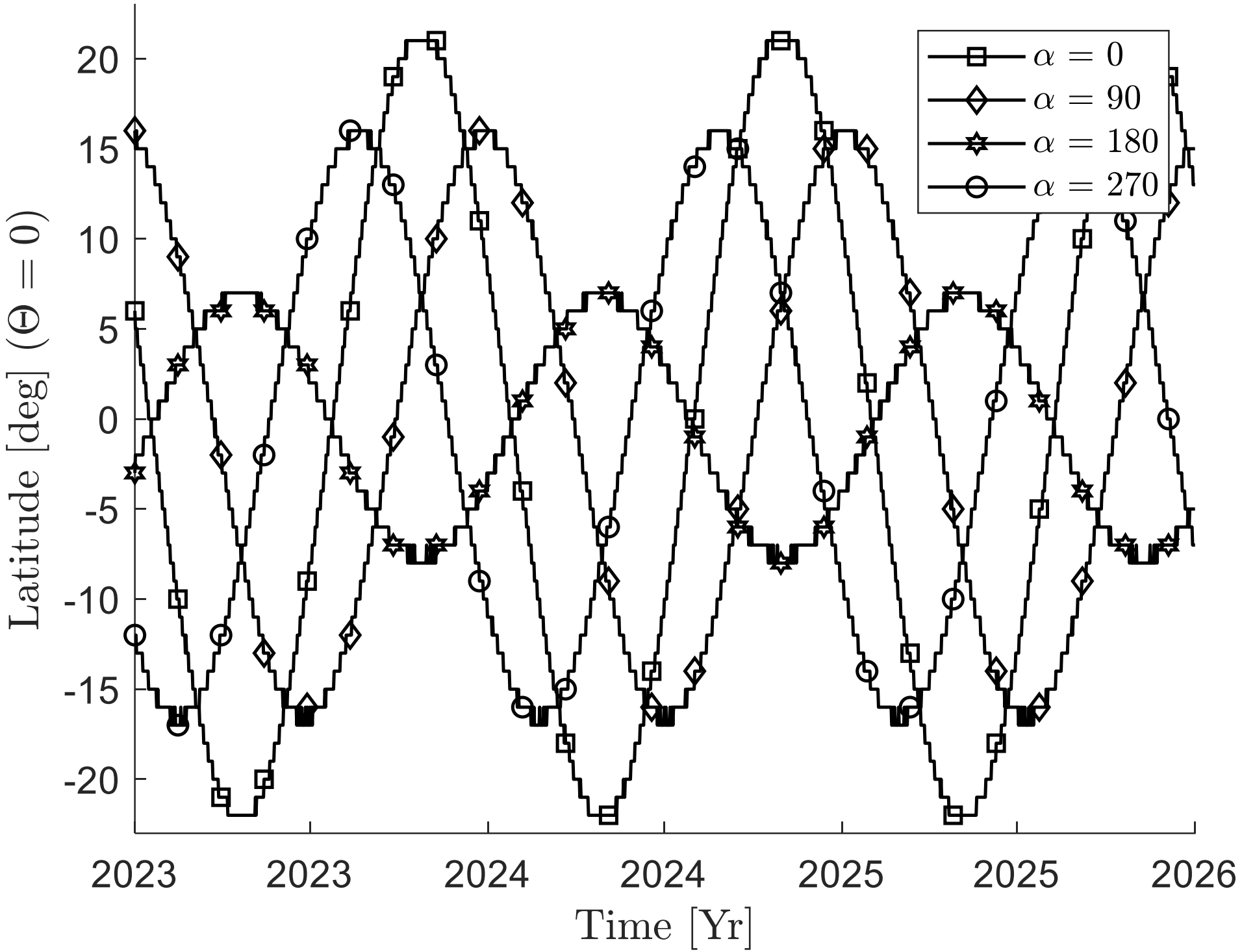

MAGNETIC
FIELD
INBOUND MARS
TRAJECTORY
OUTBOUND MARS
TRAJECTORY
MOON
EARTH
L4
L5

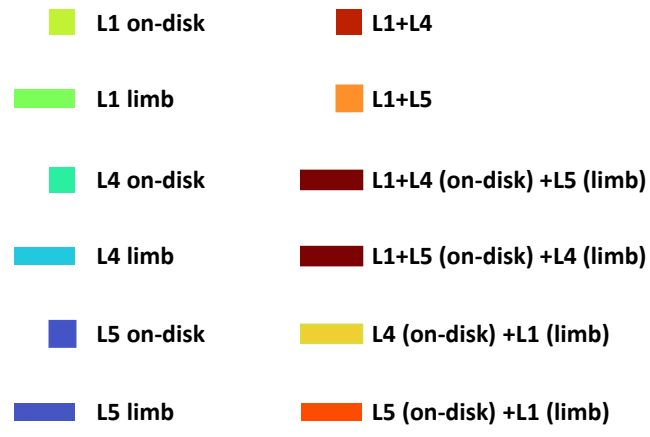

To Sun
L1
Earth
L2
Y [AU]
X [AU]
Jacobi integral
0.025
0.02
0.015
0.01
0.005
0
-0.005
-0.01
-0.015
-0.02
-0.025
0.975
0.98
0.985
0.99
0.995
1
1.005
1.01
1.015
1.02
3.0008
3.0007
3.0006
3.0005
3.0004
3.0003
3.0002
3.0001


L4
To Sun
Z [AU]
X [AU]
Y [AU]
Jacobi integral
0.4
0.3
0.2
0.1
0
-0.1
-0.2
-0.3
-0.4
0.1
0.2
0.3
0.4
0.5
0.6
0.7
0.8
0.6
0.8
1
1.2
3
2.98
2.96
2.94
2.92
2.9
2.88


A
z_{HGI}
z_E
7.25°
y_{HGI}
Heliographic Inertial
y_E
75.8°
x_E
x_{HGI}
Ecliptic
B
z_{HGI}
z_E
R^t_{LOS}
Θ^t_{ij}
y_{HGI}
$\boldsymbol{n}_{ij}$
y_E
x_E
x_{HGI}


z_{HGI}
z_E
R^t_{LOS}
y_{HGI}
$proj_e R_+$
y_E
α
$proj_e P_n$
x_E
x_{HGI}


$\alpha = 0$
$\alpha = 90$
$\alpha = 180$
$\alpha = 270$
20
15
10
5
0
-5
-10
-15
-20
Latitude [deg] ($\Theta = 0$)
2023
2023
2024
2024
2025
2025
2026
Time [Yr]

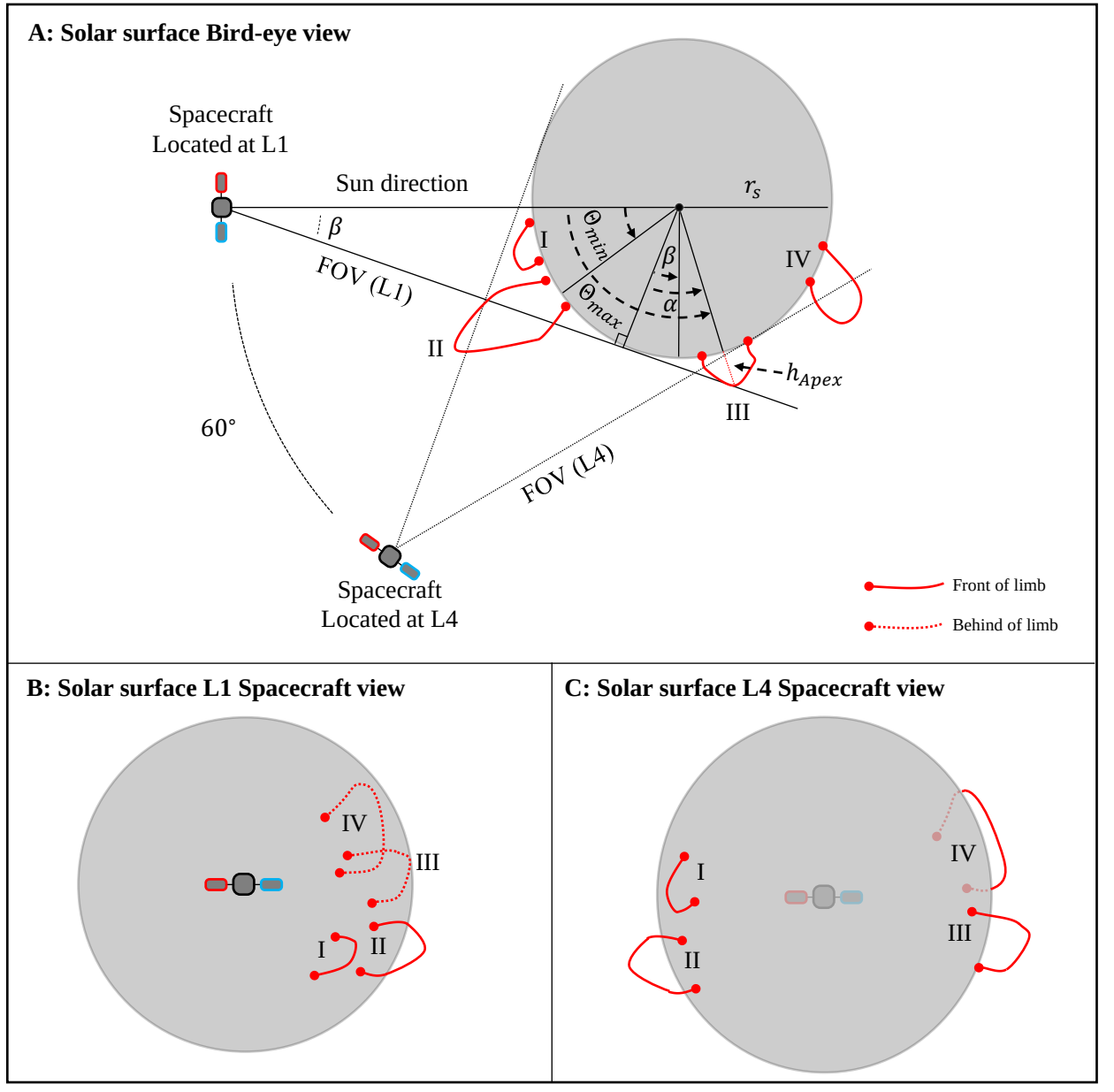

L1 on-disk
L1 limb
L4 on-disk
L4 limb
L5 on-disk
L5 limb
L1+L4
L1+L5
L1+L4 (on-disk) +L5 (limb)
L1+L5 (on-disk) +L4 (limb)
L4 (on-disk) +L1 (limb)
L5 (on-disk) +L1 (limb)

Invisible

On-disk observation

Limb observation

Stereoscopic observation


A: Solar surface Bird-eye view
Spacecraft
Located at L1
Sun direction
r_s
β
FOV (L1)
Θ_{min}
Θ_{max}
β
α
I
II
III
IV
h_{Apex}
60°
FOV (L4)
Spacecraft
Located at L4
Front of limb
Behind of limb
B: Solar surface L1 Spacecraft view
IV
III
I
II
C: Solar surface L4 Spacecraft view
I
II
IV
III