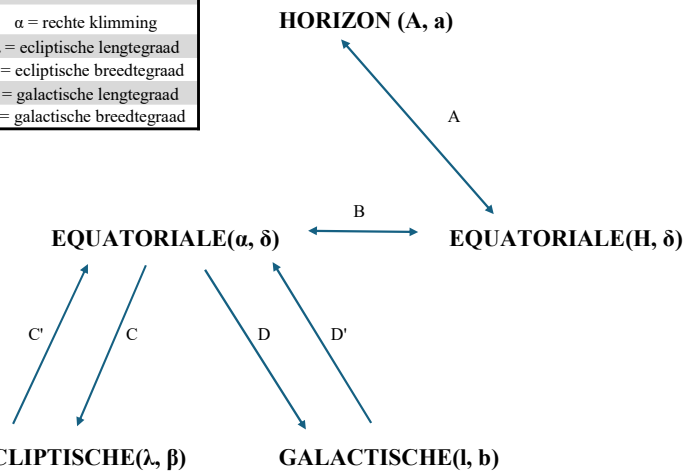
HS 31 VERALGEMEENDE COORDINATENTRANSFORMATIES

DANNY BEKAERT
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dannybekaert.be

A = azimut
a = hoogte
H = uurhoek
δ = declinatie
α = rechte klimming
λ = ecliptische lengtegraad
β = ecliptische breedtegraad
l = galactische lengtegraad
b = galactische breedtegraad



$$A = \begin{vmatrix} -\sin(\varphi) & 0 & \cos(\varphi) \\ 0 & -1 & 0 \\ \cos(\varphi) & 0 & \sin(\varphi \end{vmatrix}$$

$$B = \begin{vmatrix} \cos(ST) & \sin(ST) & 0 \\ \sin(ST) & -\cos(ST) & 0 \\ 0 & 0 & 1 \end{vmatrix}$$

$$C = \begin{vmatrix} 1 & 0 & 0 \\ 0 & \cos(\varepsilon) & \sin(\varepsilon) \\ 0 & -\sin(\varepsilon) & \cos(\varepsilon) \end{vmatrix}$$

$$C' = \begin{vmatrix} 1 & 0 & 0 \\ 0 & \cos(\varepsilon) & -\sin(\varepsilon) \\ 0 & \sin(\varepsilon) & \cos(\varepsilon) \end{vmatrix}$$

$$D = \begin{vmatrix} -0{,}0669887 & -0{,}8727558 & -0{,}4835389 \\ 0{,}4927285 & -0{,}4503470 & 0{,}7445846 \\ -0{,}8676008 & -0{,}1883746 & 0{,}4601998 \end{vmatrix} = \begin{vmatrix} a11 & a12 & a13 \\ a21 & a22 & a23 \\ a31 & a32 & a33 \end{vmatrix}$$

$$D' = \begin{vmatrix} -0{,}0669888 & 0{,}4927285 & -0{,}8676008 \\ -0{,}8727557 & -0{,}4503469 & -0{,}1883746 \\ -0{,}4835389 & 0{,}7445846 & 0{,}4601998 \end{vmatrix} = \begin{vmatrix} b11 & b12 & b13 \\ b21 & b22 & b23 \\ b31 & b32 & b33 \end{vmatrix}$$

nieuwe coordinaten (θ,ψ) **θ = atan2(n,m)** **ψ = asin(p)**

$$\begin{vmatrix} m \\ n \\ p \end{vmatrix} = \begin{vmatrix} a & b & c \\ d & e & f \\ g & h & i \end{vmatrix} . \begin{vmatrix} x \\ y \\ z \end{vmatrix}$$

m = a.x + b.y + c.z
n = d.x + e.y + f.z
p = g.x + h.y + i.z

x, y, z wordt berekend op basis van coordinaten (μ,ν) als volgt:

$$\begin{vmatrix} x \\ y \\ z \end{vmatrix} = \begin{vmatrix} \cos(\mu).\cos(\nu) \\ \sin(\mu).\cos(\nu) \\ \sin(\nu) \end{vmatrix}$$

φ	geografische breedtegraad
ST	lokale sterrentijd (radialen of graden)
ε	hellingshoek van de ecliptica

VAN	NAAR	MATRIX
HORIZON	EQUATORIALE	A
HORIZON	ECLIPTISCHE	C.B.A
HORIZON	GALACTISCHE	D.B.A
EQUATORIALE	HORIZON	A
EQUATORIALE	ECLIPTISCHE	C
EQUATORIALE	GALACTISCHE	D
ECLIPTISCHE	HORIZON	A.B.C'
ECLIPTISCHE	EQUATORIALE	C'
ECLIPTISCHE	GALACTISCHE	D.C'
GALACTISCHE	HORIZON	A.B.D'
GALACTISCHE	EQUATORIALE	D'
GALACTISCHE	ECLIPTISCHE	C.D'

$$C.B.A = \begin{vmatrix} -\cos(ST).\sin(\varphi) & -\sin(ST) & \cos(ST).\cos(\varphi) \\ -\cos(\varepsilon).\sin(ST).\sin(\varphi)+\sin(\varepsilon).\cos(\varphi) & \cos(\varepsilon).\cos(ST) & \cos(\varepsilon).\sin(ST).\cos(\varphi)+\sin(\varepsilon).\sin(\varphi) \\ -\sin(\varepsilon).\sin(ST).\sin(\varphi)+\cos(\varepsilon).\cos(\varphi) & -\sin(\varepsilon).\cos(ST) & -\sin(\varepsilon).\sin(ST).\cos(\varphi)+\cos(\varepsilon).\sin(\varphi) \end{vmatrix}$$

$$D.B.A = \begin{vmatrix} -a11.\cos(ST).\sin(\varphi)-a12.\sin(ST).\sin(\varphi)+a13.\cos(\varphi) & -a11.\sin(ST)+a12.\cos(ST) & a11.\cos(ST).\cos(\varphi)+a12.\sin(ST).\cos(\varphi)+a13.\sin(\varphi) \\ -a21.\cos(ST).\sin(\varphi)-a22.\sin(ST).\sin(\varphi)+a23.\cos(\varphi) & -a21.\sin(ST)+a22.\cos(ST) & a21.\cos(ST).\cos(\varphi)+a22.\sin(ST).\cos(\varphi)+a23.\sin(\varphi) \\ -a31.\cos(ST).\sin(\varphi)-a32.\sin(ST).\sin(\varphi)+a33.\cos(\varphi) & -a31.\sin(ST)+a32.\cos(ST) & a31.\cos(ST).\cos(\varphi)+a32.\sin(ST).\cos(\varphi)+a33.\sin(\varphi) \end{vmatrix}$$

$$A.B.C' = \begin{vmatrix} -\sin(\varphi).\cos(ST) & -\sin(\varphi).\sin(ST).\cos(\varepsilon)+\cos(\varphi).\sin(\varepsilon) & \sin(\varphi).\sin(ST).\sin(\varepsilon)+\cos(\varphi).\cos(\varepsilon) \\ -\sin(ST) & \cos(ST).\cos(\varepsilon) & -\cos(ST).\sin(\varepsilon) \\ \cos(\varphi).\cos(ST) & \cos(\varphi).\sin(ST).\cos(\varepsilon)+\sin(\varphi).\sin(\varepsilon) & -\cos(\varphi).\sin(ST).\sin(\varepsilon)+\sin(\varphi).\cos(\varepsilon) \end{vmatrix}$$

$$D.C' = \begin{vmatrix} a11 & a12.\cos(\varepsilon)+a13.\sin(\varepsilon) & -a12.\sin(\varepsilon)+a13.\cos(\varepsilon) \\ a21 & a22.\cos(\varepsilon)+a23.\sin(\varepsilon) & -a22.\sin(\varepsilon)+a23.\cos(\varepsilon) \\ a31 & a32.\cos(\varepsilon)+a33.\sin(\varepsilon) & -a32.\sin(\varepsilon)+a33.\cos(\varepsilon) \end{vmatrix}$$

$$A.B.D' = \begin{vmatrix} -b11.\sin(\varphi).\cos(ST)-b21.\sin(\varphi).\sin(ST)+b31.\cos(\varphi) & -b12.\sin(\varphi).\cos(ST)-b22.\sin(\varphi).\sin(ST)+b32.\cos(\varphi) & -b13.\sin(\varphi).\cos(ST)-b23.\sin(\varphi).\sin(ST)+b33.\cos(\varphi) \\ -b11.\sin(ST)+b21.\cos(ST) & -b12.\sin(ST)+b22.\cos(ST) & -b13.\sin(ST)+b23.\cos(ST) \\ b11.\cos(\varphi).\cos(ST)+b21.\cos(\varphi).\sin(ST)+b31.\sin(\varphi) & b12.\cos(\varphi).\cos(ST)+b22.\cos(\varphi).\sin(ST)+b32.\sin(\varphi) & b13.\cos(\varphi).\cos(ST)+b23.\cos(\varphi).\sin(ST)+b33.\sin(\varphi) \end{vmatrix}$$

$$C.D' = \begin{vmatrix} b11 & b12 & b13 \\ b21.\cos(\varepsilon)+b31.\sin(\varepsilon) & b22.\cos(\varepsilon)+b32.\sin(\varepsilon) & b23.\cos(\varepsilon)+b33.\sin(\varepsilon) \\ -b21.\sin(\varepsilon)+b31.\cos(\varepsilon) & -b22.\sin(\varepsilon)+b32.\cos(\varepsilon) & -b23.\sin(\varepsilon)+b33.\cos(\varepsilon) \end{vmatrix}$$