HS 31 VERALGEMEENDE COORDINATENTRANSFORMATIES

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VRAAG: Hoeveel bedraagt de azimut(A) en hoogte(a) van een planeet met ecliptische coordinaten 97° 38' 17,228" lengtegraad en -17° 51' 28,688" breedtegraad voor een waarnemer op geografische breedtegraad 52° 10' 31,0" om lokale sterrentijd 5h 9' 21,103"?
De hellingshoek van de ecliptica bedraagt 23° 26' 46,45".

OPLOSSING:

$\lambda = 97 + (38/60) + (17,228/3600) = 97,638119$ decimale graden
$\beta = - (17 + (51/60) + (28,688/3600) = -17,857969$ decimale graden

$\mu = 97,638119$ decimale graden
$\nu = -17,857969$ decimale graden

$x = \cos(\mu) \,.\, \cos(\nu) = -0,126512$
$y = \sin(\mu) \,.\, \cos(\nu) = 0,943374$
$z = \sin(\nu) = -0,306658$

Vereiste matrix = A.B.C' met
$\varepsilon = 23 + (26/60) + (46,45/3600) = 23,446236$ decimale graden
ST = 5 + (9/60) + (21,103/3600) = 5,155861944 decimale uren = 5,155862 . 15 = 77,337930 decimale graden
$\varphi = 52 + (10/60) + (31,0/3600) = 52,175278$ decimale graden

A.B.C' =

-sin(φ).cos(ST)	-sin(φ).sin(ST).cos(ε)+cos(φ).sin(ε)	sin(φ).sin(ST).sin(ε)+cos(φ).cos(ε)
-sin(ST)	cos(ST).cos(ε)	-cos(ST).sin(ε)
cos(φ).cos(ST)	cos(φ).sin(ST).cos(ε)+sin(φ).sin(ε)	-cos(φ).sin(ST).sin(ε)+sin(φ).cos(ε)

A.B.C' =

-sin(52,175278).cos(77,337930)	-sin(52,175278).sin(77,337930).cos(23,446236)+cos(52,175278).sin(23,446236)	sin(52,175278).sin(77,337930).sin(23,446236)+cos(52,175278).cos(23,446236)
-sin(77,337930)	cos(77,337930).cos(23,446236)	-cos(77,337930).sin(23,446236)
cos(52,175278).cos(77,337930)	cos(52,175278).sin(77,337930).cos(23,446236)+sin(52,175278).sin(23,446236)	-cos(52,175278).sin(77,337930).sin(23,446236)+sin(52,175278).cos(23,446236)

A.B.C' =

-0,173144	-0,463044	0,869259
-0,975680	0,201102	-0,087217
0,134424	0,863220	0,486602

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

m		**-0,173144**	**-0,463044**	**0,869259**		**-0,126512**	
n	**=**	**-0,975680**	**0,201102**	**-0,087217**	**.**	**0,943374**	
p		**0,134424**	**0,863220**	**0,486602**		**-0,306658**	

m		**-0,681484**
n	**=**	**0,339895**
p		**0,648113**

Azimut(A) = atan2(0,339895,-0,681484) = 153.491946 decimale graden = 153° 29' 31"
hoogte(a) = asin(0,648113) = 40,339481 decimale graden = 40° 23' 58"