

ENSM Le Ha.vre	<b>LATITUDE PAR LA POLAIRE &amp; VARIATION DU COMPAS</b>	V2.0– 02/19
<i>A. Charbonnel</i>	<b>EXERCICES</b>	1/1

### **Documents nécessaire :**

- Nautical Almanac 1981
- Calculatrice

## **Atelier 1 : Latitude et variation par la polaire**

### **Exercice 1.1 Latitude & variation par la polaire**

On 25 october 1981 at 03h 30 min 05s UT, in DR position  $32^{\circ} 22,9'N$  /  $031^{\circ} 20'E$ , Polaris was bearig  $358,1^{\circ}$  ; the sextant altitude was  $32^{\circ} 42,4'$  ; index error  $1,6'$  on the arc ; height of eye 14 m. Find latitude, compass error and position line

### **Exercice 1.2 Latitude par la polaire**

On 16 December 1981, your 1810 zone time DR position is LONG  $129^{\circ}46.5' W$ . At that time you observe Polaris with a sextant altitude (hs) of  $23^{\circ}56.8'$ . The chronometer time of the sight is 03h 12m 31s, and the chronometer error is 02m 16s fast. The index error is  $2.5'$  off the arc, and the height of eye is 52.6 feet. What is your latitude by Polaris?

### **Exercice 1.3 Variation par la polaire**

On 11 January 1981, your 0450 ZT position is LAT  $38^{\circ}42'N$ , LONG  $14^{\circ}16'W$ . You observe Polaris bearing  $358.5^{\circ}pgc$ . At the time of the observation the helmsman noted that he was heading  $160^{\circ}pgc$  and  $173^{\circ}psc$ . The variation is  $9^{\circ}W$ . What is the deviation for that heading?

## **Atelier 2 : Variation au lever/coucher d'un astre**

### **Exercice 2,1 : Variation au coucher du Soleil (bord inf)**

Le 28 août 1981 à la position estimée  $\varphi_E = 27^{\circ}35' N$  et  $G_E = 151^{\circ}42' W$  on a relevé le Soleil au moment du coucher apparent du bord supérieur et obtenu  $Z_c=282,5^{\circ}$ . Déterminer la variation du compas.

### **Exercice 2.2 : Variation au lever du Soleil (bord sup)**

Le 01 septembre 1981 à la position estimée  $\varphi_E = 47^{\circ}13' N$  et  $G_E = 151^{\circ}38' W$  on a relevé le Soleil au moment du lever apparent du bord supérieur et obtenu  $Z_c= 077,5^{\circ}$ . Déterminer la déclinaison du Soleil pour l'instant du lever apparent. Déterminer la variation du compas.

### **Exercice 2.3 : Variation au coucher vrai du Soleil**

On 28 September 1981, in DR position LAT  $27^{\circ}16.7'S$ , LONG  $113^{\circ}27.2'W$ , you observe an amplitude of the Sun. The Sun's center is on the celestial horizon and bears  $273^{\circ}psc$ . The chronometer reads 01h 17m 26s and is 01m 49s slow. Variation in the area is  $6^{\circ}W$ .

- 1- Define what is the approximate observed Sun's altitude above the apparent horizon when the sun's center is a on celestial horizon.
- 2- What is the deviation of the standard magnetic compas s?

*Note : be carefull variation has not the same meaning in french and in english*

### **Réponses partielles :**

- Exercice 1.2 :  $23^{\circ}07.8'N$
- Exercice 1.3 :  $3^{\circ}W$
- Exercice 2.3 :  $W = 0.4^{\circ}E$

