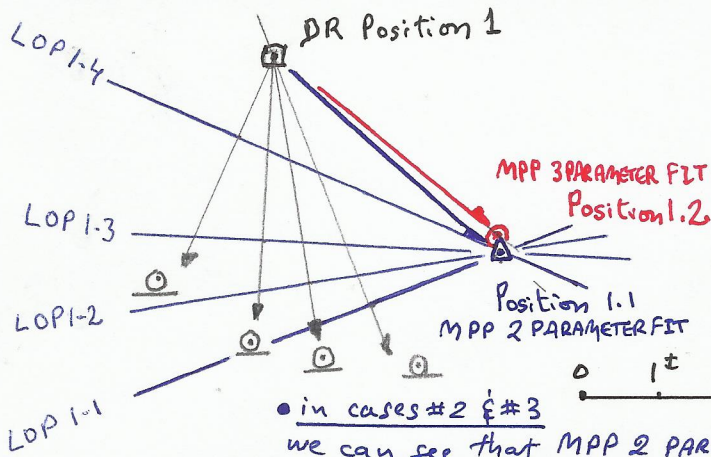


**CASE #1**

- LOP 1-1:  $+3.5^\pm/159^\circ$
- LOP 1-2:  $+3.0^\pm/171^\circ$
- LOP 1-3:  $+2.4^\pm/183^\circ$
- LOP 1-4:  $+1.1^\pm/204^\circ$

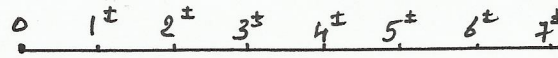
**SOME DANGERS OF THE MPP 3 PARAMETER FITS**



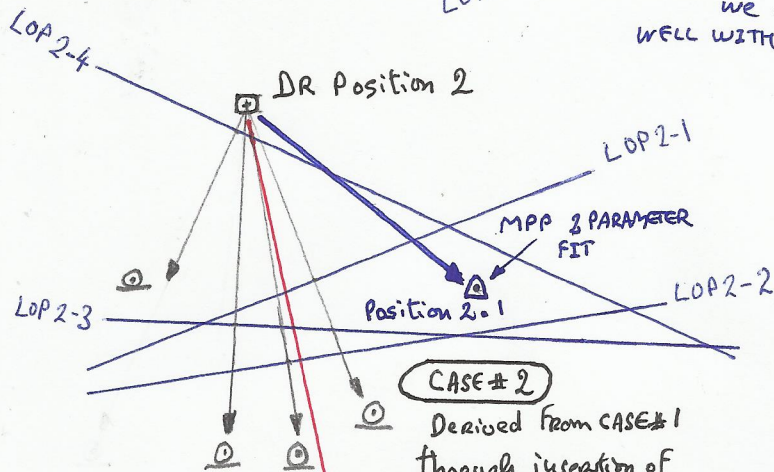
Position 1.1 =  $130^\circ/DR1/4.0^\pm$   
 SDEV 1.1 =  $7.4 \cdot 10^{-3} \pm$

$E_1 = +0.15^\pm$   
 Position 1.2 =  $128^\circ 16'/DR1/3.90^\pm$   
 SDEV 1.2 =  $0.00 \pm$

SCALE:  $1 \text{ NM} = 1' = 1 \text{ cm}$



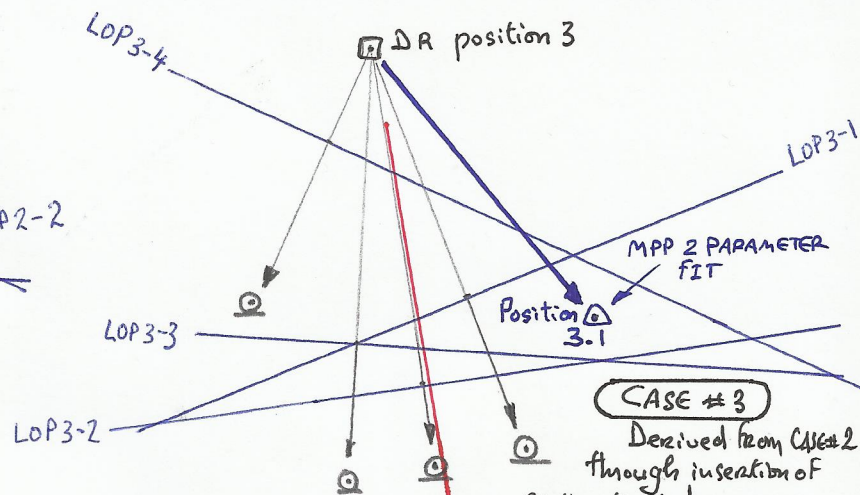
• in cases #2 & #3  
 we can see that MPP 2 PARAMETER FITS COPE QUITE WELL WITH RANDOM NOISE AND ALSO CONSTANT INDEX ERROR



**CASE #2**

- Derived from CASE #1 through insertion of RANDOM NOISE
- LOP 2-1:  $+2.5^\pm/159^\circ$
  - 2-2:  $+3.5^\pm/171^\circ$
  - 2-3:  $+2.9^\pm/183^\circ$
  - 2-4:  $+0.4^\pm/204^\circ$

Position 2.1 =  $128^\circ/DR2/3.9^\pm$   
 SDEV 2.1 =  $0.7 \pm$   
 $E_2 = -18.78 \pm$   
 Position 2.2 =  $174^\circ 01'/DR2/22.11^\pm$   
 SDEV 2.2 =  $0.13 \pm$



**CASE #3**

- Derived from CASE #2 through insertion of systematic index error equal to  $+1.0'$
- LOP 3-1:  $+3.5^\pm/159^\circ$
  - 3-2:  $+4.5^\pm/171^\circ$
  - 3-3:  $+3.9^\pm/183^\circ$
  - 3-4:  $+1.4^\pm/204^\circ$

Position 3.1 =  $139^\circ/DR3/4.6^\pm$   
 SDEV 3.1 =  $0.6 \pm$   
 $E_3 = -17.78 \pm$   
 Position 3.2 =  $174^\circ 01'/DR3/22.11^\pm$   
 SDEV 3.2 =  $0.13 \pm$

**NOTE:**

This is a difficult case (limited number of observations, and limited azimuth coverage  $45^\circ$ ), but nonetheless not an un-frequent case. This "CASE #1" is the exact transcription of observations carried out in February 1976 in the Indian Ocean

• in cases #2 & #3

we can see that the MPP 3 PARAMETER FITS are OVERLY sensitive to RANDOM NOISE

• in case #3 we can see that the statistics (MPP3) exactly smoke out the added constant  $1.0'$  index error

**LESSONS LEARNT**

**IN ORDER TO SAFELY USE MPP3 PARAMETER STATISTICS:**

- 10 to 12 observations minimum, AND
- Observations are to be evenly distributed over the whole HORIZON

ANTOINE M. "HERMIT" COUËTTE



Feb. 26<sup>th</sup>, 2015

MPP 3 PARAMETER FIT

Position 2.2

MPP 3 PARAMETER FIT

Position 3.2

(Same as Position 2.2)