

Gert König Langlo (2012) Validation routines for synoptic observations. *Alfred Wegener Institute for Polar and Marine Research, Bremerhaven*

All synoptic observations have been visualized and manually inspected. Additionally, they are validated according to the following rules:

- 1.) hh in (0.00, 3.00, 6.00, 9.00, 12.00, 15.00, 18.00, 21.00) UTC
- 2.) $0 \leq ff < 99$
- 3.) $0 \leq dd \leq 360$
- 4.) $TdTdTd \leq TTT$
- 5.) For stations: Relative Humidity > 15 %
- 6.) For ships: Relative Humidity > 35 %
- 7.) $920 \leq PPPP \leq 1050$
- 8.) VV in (90 - 99)
- 9.) ww in (00 - 99)
- 10.) N in (0 - 9)
- 11.) If VV ≥ 97 then ww not in (28, 39, 40, 43, 45, 47, 49, 55, 59, 63, 65, 67, 69, 73, 75)
- 12.) If N = 0 then ww not in (20 - 29, 50 - 75, 80 - 99)
- 13.) If TTT > 0.0 then ww not in (48, 49)
- 14.) If TTT ≤ -1.0 then ww not in (50 - 55, 58, 59)
- 15.) If TTT > 1.0 then ww not in (56, 57)
- 16.) If TTT < -2.0 then ww not in (60, 65)
- 17.) If TTT > 0.0 then ww not in (66, 67)
- 18.) If $-2.0 < TTT < 10.0$ then ww not in (68, 69)
- 19.) If TTT > 7.0 then ww not in (70 - 79)
- 20.) If TTT > 0.0 then ww not in (76 - 79)
- 21.) If TTT < -2.0 then ww not in (80 - 82)
- 22.) If TTT < 2.0 or TTT > 10.0 then ww not in (83, 84)
- 23.) If TTT > 10.0 then ww not in (85 - 88)
- 24.) If TTT < -2.0 then ww not in (91, 92)
- 25.) Nh in (0 - 9)
- 26.) Cl in (0 - 9)
- 27.) Cm in (0 - 9)
- 28.) Ch in (0 - 9)
- 29.) h in (0 - 9)
- 30.) $N \geq Nh$
- 31.) If N = 0 then Cl = 0
- 32.) If N = 0 then Cm = 0
- 33.) If N = 0 then Ch = 0
- 34.) If Nh = 0 then Cl = 0
- 35.) If Nh = 0 then Cm = 0
- 36.) If Nh = 0 then h ≥ 0
- 37.) If N > 0 then (Cl and Cm and Ch) not 0
- 38.) If Nh = 8 then Ch = missing
- 39.) TMax $\geq TTT$ of the last 12 hours
- 40.) TMin $\leq TTT$ of the last 12 hours
- 41.) $ppp = \text{abs}(PPPP - PPPP(-3 \text{ hours}))$
- 42.) If $PPPP - PPPP(-3 \text{ hours}) > 0$ then a in (0, 1, 2, 3)
- 43.) If $PPPP - PPPP(-3 \text{ hours}) = 0$ then a = 4
- 44.) If $PPPP - PPPP(-3 \text{ hours}) < 0$ then a in (5, 6, 7, 8)

Missing values are allowed except in the metadata like Date/time, Lat, Long. All data which violate these rules were inspected and manually corrected if necessary.