MASC FireDAC Client / SDB Documentation

Flake statistics cheat sheet

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Name** | **Summary and/or [Units]** | **Min** | **Max** | **Thresholds** | **Meanings** |
| Fall speed | **[m/s]** | -99.0 | 99.0 |  |  |
| Max Diameter | The length of the axis that is the maximum diameter of the flake cross-section **[mm]** | 0 | 9999.0 |  |  |
| Equivalent radius | The area-equivalent radius of the flake **[mm]** | 0 | 999.0 |  |  |
| Perimeter | **[mm]** | 0 | 9999.0 |  |  |
| Cross Section | **[mm^2]** | 0 | 99999.0 |  |  |
| Aspect Ratio | Ratio of the axis length with the smallest diameter to the max diameter | 0 | 1 |  |  |
| Complexity | Product of two values. 1) Ratio of perimeter to the computed circumference using . 2) 1 + the average inter-pixel brightness of the flake. | 0 | 99.0 | < 1.35 | Tends to be lump or conical graupel |
| > 1.75 | Tends to be more aggregated |
| Focus | The voll4 Focus measure as shown in Santos, 1997, **but** for some reason implemented as a global mean instead of double summation. Perhaps to take advantage of smaller values? We tried as double summation and the numbers become very large, but a log scale isn’t very helpful either. | 0 | 99999.0 | < 15 | Almost definitely out-of-focus |
| > 100 | Good chance to be in-focus (the higher the threshold, the more likely) |
| Total Pores | The number of pores detected in the flake | 0 | 99999 |  |  |
| Mean Pore Area | Average size of the pores detected **(not yet implemented)** |  |  |  |  |
| Symmetry | **(not yet implemented)** |  |  |  |  |
| Frac | Proxy for the fracturedness of the flake. Weighted average of the distance between each pixel and the closest non-zero pixel. As such, the expected result is that lower Frac is associated with more aggregates and dendrites. | 0 | 99.0 | < 1.5 | Likely to be aggregates, dendrites, less rimed |
| > 1.6 | More likely to be rimed, with graupel more likely the higher the value |
| Mean Intensity | Average brightness of the flake | 0 | 255 |  |  |
| Solidity | The ratio of the area of the flake to the area of the convex hull that encloses the flake | 0 | 1 |  |  |
| Radial Variance | From the calculated center of the flake, a line is drawn at each angle from 0 to 359 (360 lines). The radial variance is the variance of the lengths of these lines. | 0 | 99.0 | < 1.5 | Probably graupel |
| > 2 | Probably aggregates |
| Roughness | The difference between the max diameter and the max diameter as calculated by the measured area of the flake **[mm]** | 0 | 999.0 |  |  |
| Corners | The estimated number of corners the flake has… (still experimental) |  |  |  |  |
| Concave Number | Same as solidity, but computes the absolute difference instead of the ratio **[mm/2]** |  |  |  |  |
| Foc Voll4 Revised | The voll4 Focus measure from above, but normalized by the average pixel intensity. | 0 | 999 | ? | TBD |
| Foc NorVar | The normalized variance Focus measure as defined in Santos, 1997. Same as below but divided by mean pixel intensity. | 0 | 9999 | ? | TBD |
| Foc Variance | The variance Focus measure as defined in Santos, 1997. Average square difference between each pixel and average pixel intensity. | 0 | 999999 | ? | TBD |
| Foc GaussDiff | The average absolute difference in pixel intensity between original image and a gaussian filtered version of the image (using Matlab imgaussfilt with filter of 3). | 0 | 999 | ? | TBD |
| Foc GaussDiff Voll4 | A weird combination…  The absolute difference between Foc Voll4 Revised as measured on (a) the original image and (b) a gaussian filtered version of the image (using Matlab imgaussfilt with filter of 3). | 0 | 99 | ? | A value closer to 0 means that the gaussian filter didn’t change the image much, meaning it’s likely out of focus.  Close to 0 -> Out of focus |

References

Santos et. al. 1997. ‘Evaluation of autofocus functions in molecular cytogenetic analysis’