Evolution of k versus SWI

During the day:
1. The bigger sensitivity is when SWI > 0 and less than 0.1.
2. The relationship is not constant in the interval.
3. The dependence of k with Veg and LAI/RSmin is bigger than OI.
4. It is not necessary more controls for the size of the increments like OI does.

During the night:
1. The bigger sensitivity is when SWI > 0 and less than 0.1.
2. The relationship is not constant in the interval.
3. The dependence of k with Veg and LAI/RSmin is much bigger than OI.

The values k during the day are much bigger than OI values.

In OI there isn’t any dependences.
In EKF the analysis have no effect for points with SWI below 0, neither for values bigger than 1.
Another important fact is that the values of k are bigger near SWI = 0 and the dependence is not constant for the interval.

In OI there isn’t any dependences.

Both methods also have very different performance. In EKF, the k is of most of the points are in the area where LAI/RSmin < 0.4. On the other hand in OI the points with high value of k have LAI/RSmin also high (near 0.6) and the dependence is linear.

CONCLUSIONS

In order to improve the knowledge of the new method a comparison between the OI method and EKF method has been done.

1. During the day the size of the elements of Kalman Gain Matrix are smaller for EKF than for OI. This fact makes that the balance between the initial fields and the physics of the model will be slower.
2. During the night the k’s values are much bigger than the OI ones, although much smaller than the daytime ones.
3. The dependence of k with Veg and LAI/RSmin is more realistic for EKF than for OI.
4. The sensitivity is dependent of the soil water content for EKF.
   1. The bigger sensitivity is when SWI = 0 and less than 0.1.
   2. The relationship is not constant in the interval.
   3. It is negligible for soils with SWI > 1 and SWI < 0.

This fact will be a problem if the soil is in the initial condition is too dry, thus the analysis won’t increase the humidity in the soil.
4. It is not necessary more controls for the size of the increments like OI does.

More studies are needed for the rest of control variables, the main one should be temperature in the second layer of the soil.

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Maria Diez Muyo (mdiezm@aemet.es)

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TWP Group, AEMET