

1- Pending questions about the vision of Uranus banding pattern:

Our eyes are sensitive to contrast level for a given detail size.

This depends indeed from the scope in use (diameter and strehl involved) but also on the observer itself and the sky conditions (transparency, moisture, dust, seeing).

Our ability is as it is and this is gift received, training can improve such for reaching our ultimate abilities. We cannot do more.

CCD chipsets has also limits, largely unknown by most users, even prestigious (more I am investigating in and more I see this).

On visual investigation, we have steps of difficulty for going ahead beyond:

- Color of the disk seen: no interest except if declarations makes color still with 2D magnifications even 1D, witness to be discarded,
- Vision of the planet limb darkening: a first step,
- For 2013, vision of EZ and more the bright collar surrounding the polar cap, a second level,
- Vision of the banding pattern, a third level,
- Vision of the banding pattern and albedo variations, a fourth level,
- Vision of the brightening and spotting: depends on their own contrasts but say from the second level and upper.

When doing this scaling, the change of the aperture by say 2 times may involve the possibility of discovering more, not night and day effect, but substantially from the second step well anchored from an observer.

The contrast transfer between a 200mm versus a 400mm aperture remains the following (for a 1% contrast detail on planet and 1" arc band width):

- 200mm: contrast 0.59% at eyepiece, needs 360x with seeing 7-8/10,
- 400mm: contrast 0.74% at eyepiece, needs 710x with seeing 7-8/10,
- 1000mm: contrast 0.88% at eyepiece, needs 1780x with seeing 7-8/10,

for keeping the optimal planet surface brightness and get only 25% more in contrast level when involving 2 times aperture from 200mm. This may help for merging from the noise from an observer to another. These are evaluations but tendency remains kept.

This is important to consider as still to-day most of people consider this difficulty level similar to Mars kind of observations, this has nothing to do similar because the question wear capability to reach 1-2 % contrast levels, also and even applying to CCD imagers.

When the subject is at a margin, experience, competence and ability prevail, I think we have to consider accordingly.

2- Expected patterns observable versus wavelengths:

Essentially on 3 spectral segments:

-visual: 485 and 619nm methane rays around

-NIR: 889nm methane ray around

-IR: 1600nm methane ray around.

Images published in IR domain show a banding pattern with hard contrast transition at the band limits.

Images published in NIR show a banding pattern with hard contrast transition at the band limits (some start to show albedo variation on some part of the planet).

Images published in visual domain show a banding pattern with soft contrast transition and albedo variations on some part of the planet surface.

Albedo variations exhibited at the margin constitute nevertheless a point to be considered seriously.

This is not a mistake to evaluate these albedo variations for the following reason:

- IR: this shows the planet status at bottom layers of the atmosphere, closer to the rocky node of the planet,
- NIR: this shows (if the imaging acquisition parameters are well mastered, remains to be proven) the layer at mid depth into atmosphere,
- Visual: this shows the status of the upper layer of the atmosphere.

Therefore, albedo variations (brightening observed, soft contrast transitions) could be observed more and more as the atmosphere layers merge to the outer surface.

This idea is nevertheless pondered anyway when considering that visual domain is lead mostly by solar light reflection and atmosphere absorption, IR light is lead mostly by the planet node emission and atmosphere absorption.

Spots or iced clouds stays at the outer surface and may come from condensation of the aerosols of the outer atmosphere layers. The association of spots and brightening (started to be observed visually) constitute a probable scenario.

Indeed, confirmations are needed and when some other can report similarly, can this be discarded?

Discussion and comments about are welcome.

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