Model logs

Note down the time and modification made to the model each time

2015-5-25 starts to transform the basic Grape model into a complex one. First convert the daily calculation into hourly calculation; second add the complex light model. Control whether there is light or not by the sunrise time and sunset time. We use math.round sunrise and sunset to get a integer number. The error in this rounding method is minimized by the calculation of light power within each hour. The calculation of light power does not follow the exactly hour. Instead, we use the sunset time minus the sunrise time to get the number of points that we want to calculate. These number is equally distributed over the real day length with decimal numbers.

Save the model or initialize the model before closing. Else you would get problems in opening, big memory.

2015-5-26 exploring the light model:

Some problems I met:

1. I tried to use setVisulize for the spectral light, However it doesn’t work. It works for other light sources like directional light.
2. With the old light model, the AlgorithmSwitchShader works well. However, for the new light model there are some issues. See the code and image.
3. For the directional light we use setPowerDensity() to give the power. And for others like spectral light and spot light we use setPower(). What is the difference between them? I tried the directional light and spot light in the code. I find to reach the same illumination, directional light need much lower power compare to spot light. For directional light I only need powerDensity 1 to reach the same illumination by spot light with power 100.
4. The meaning of the parameters for spectral light (correct me if I am wrong): a. physical distribution defines the direction of the rays. In the double array, the number of rows represents the rings or plane that you defined. The horizontal angle can be calculated using 180/the number of rows. One row of array represent the points in one ring. The vertical angle can be calculated using 360/number of points in one row. However I do not understand the meaning of those values in the DISTRIBUTION array. In the daylight example they were 1, and in the Lamp test environment there were more than 3000. b. Spectral curve defines the wavelengths and amplitudes of the light source. Amplitudes are expressed in relative terms. When we use BlackbodySpectralCurve, then it uses a function of temperature to calculate the wavelengths and amplitudes. C. power I feel in the new light model, it is better to express the power in W m-2. It is commonly measured and is an instant value. The power is the
5. When we use the directional light, spot light and other light sources, we can not specify the Spectral curve, but we can measure the absorption of different wavelength as shown in the daylight example. However, I was wondering what are the default spectral curves for those light sources. Uniform distribution for all wavelengths or not?
6. I see in the measure mode, GPU\_LM. setMeasureMode (MeasureMode. FULL\_SPECTRUM); we have options to choose full spectrum, integrate, and RGB. This is very nice. So if we only care about total radiation and PAR, we can just use integrate. Given the details and complexity of the spectral curve, I think for light interception and photosynthesis, I can just use directional light. Maybe for red:far red ratio we can use the full spectrum. However, when I use INTEGREATED\_SPECTRUM in the full spectrum example, I got an error for unexpected exception even I suppressed the output.
7. I was wondering can I use the spectral light in the diffuse sky light settings using an array of 72 directional lights positioned regularly in a hemisphere in six circles. Do we need some adaptations for this application. It seems not. See my code of the directlight and diffuse light. With new light model and directional light, it works (fraction of intercepted light close to 1). However for spectral light, it provides a very high value for the fraction of light intercepted by the tiles.
8. How to use the object Patch. Right now I use lots of tiles to build the soil. maybe with patch, one sentence can do the all.
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10. What are the difference between setSpecular, and setDiffuse?
11. What does grayStone used for?
12. How to search the properties of a module in the console?
13. FluxLightModel lm = new FluxLightModel(RAYS\*1000000, 10);

lm.setSeed(SEEDS[j]); lm.compute();

1. [getSensedIrradiance](http://wwwuser.gwdg.de/%7Egroimp/api/de/grogra/rgg/FluxLightModel.html#getSensedIrradiance%28%29)() is for sensornode, while [getAbsorbedPowerMeasurement](http://wwwuser.gwdg.de/%7Egroimp/api/de/grogra/rgg/FluxLightModel.html#getAbsorbedPowerMeasurement%28de.grogra.graph.impl.Node%29)() is for object. Double
2. Measurement getAbsorbedPowerMeasurement(Node node)
3. Spectrum getAbsorbedPower(Node node)

2015-6-2 never name the variable as the same within the GroIMP, like name relative humidity as RH can cause lots of problems since RH is used in the GroIMP for rotating.

2015-6-2 to 4 separate the global parameters and plant parameters, change the chart and table outputs.

2015-6-5 change the model updating structure, hiding update in the module

2015-6-18 add water potential module

2015-6-23 improved the visulization of berry bunch

2015-6-25 switch the model into a static model and read model paramters from different files

2015-6-29 add berry growth module

2015-7-5 add the NEMA model

2015-7-8 reflection on the model, current status and problems

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2015-11-20 for optimization I removed the random process in the initiation modular and leaf modular. Add this back later…………….

2015-12-1 I wrote an example code of error handling to Michal henke in looking for help. He provided the solution based on the solver’s error handling method.

2015-12-2 start to optimize water flux again. I suppressed the carbon allocation and berry growth for this purpose, set them back later.

2015-12-3 for improving the light interception, I make the phyllotax into 137.5

2015-12-4 adding the Gxc buffering part for the leaf transpiration and leaf water potential

2015-12-10 do not delete chart or tables, it makes unable to open the model