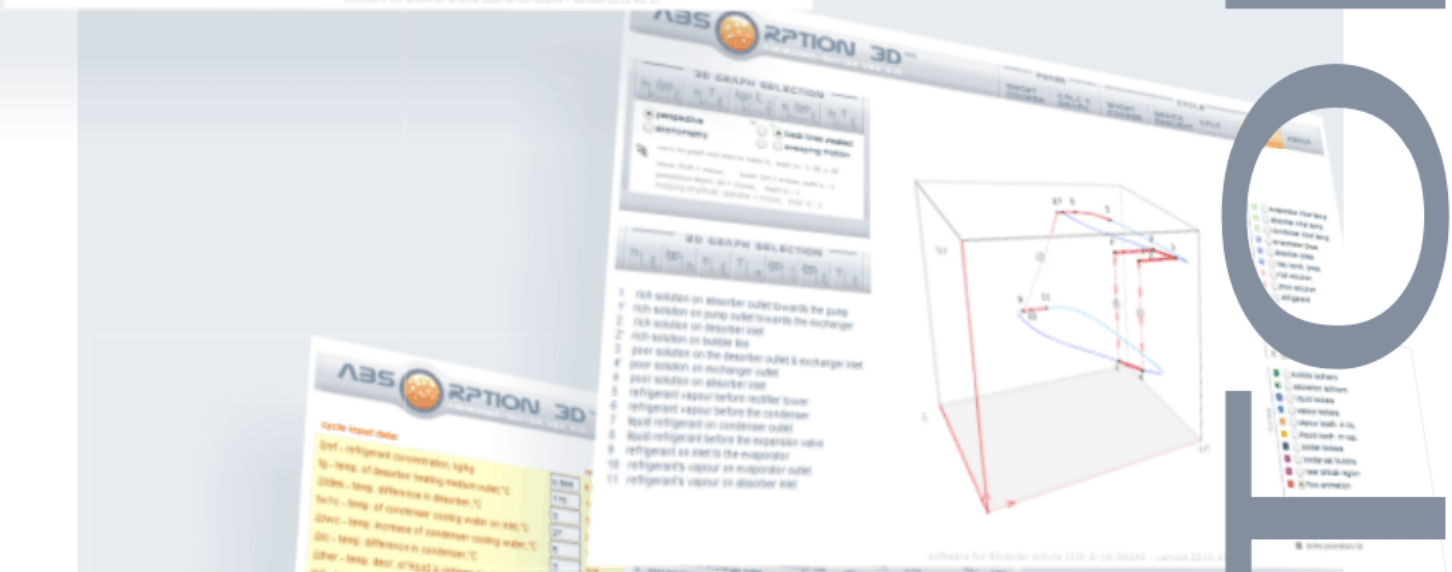
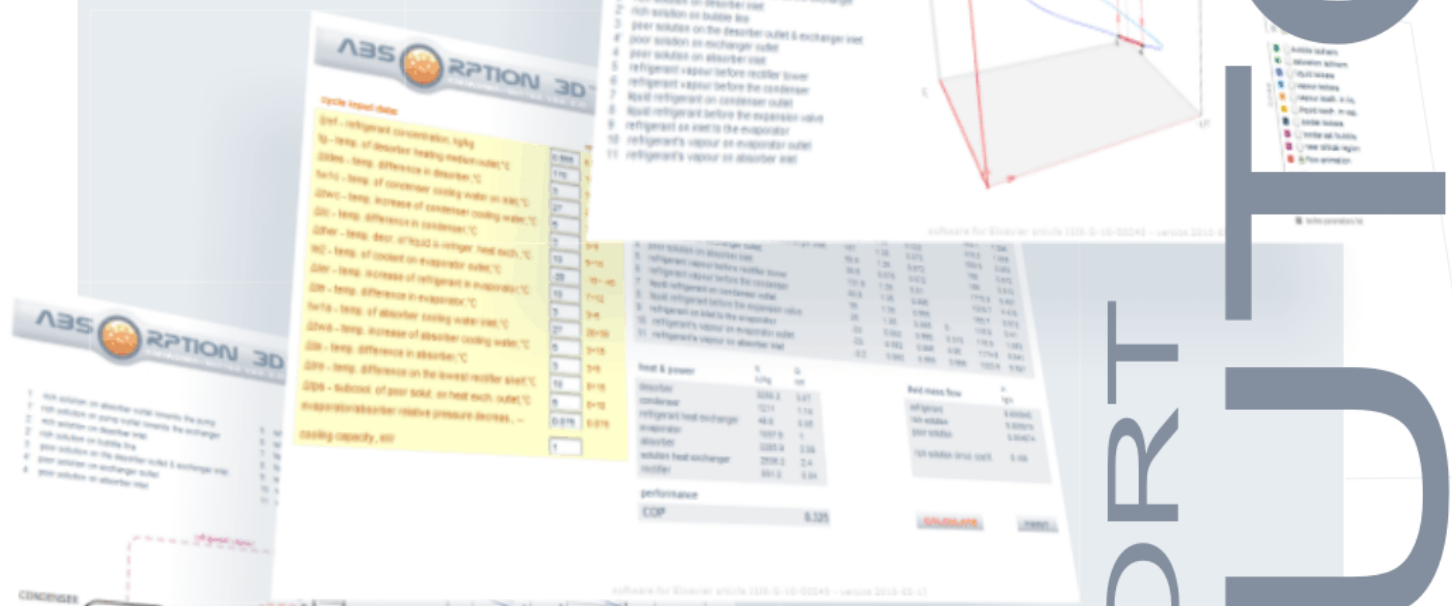





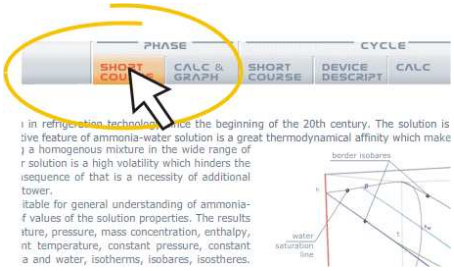


# TUTORIAL

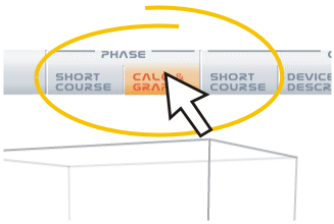
## SHORT

Look at upper bar, there are two groups of buttons: PHASE and CYCLE part

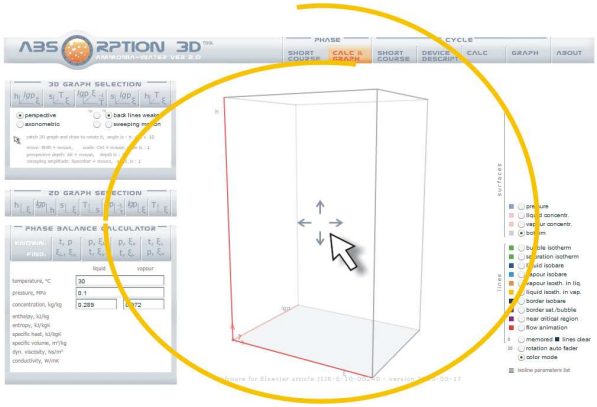

Press PHASE - SHORT COURSE, look at entrance text and figures ar presented, read it



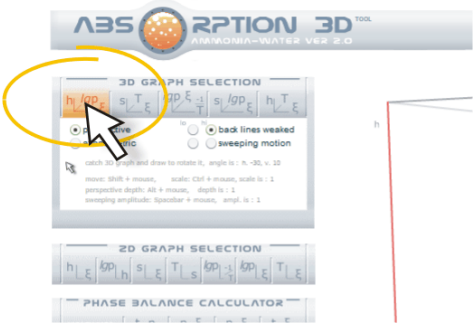

Press PHASE CALC & GRAPH, that's important part of the software



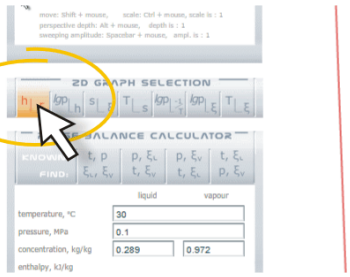

Look at the box on the screen, that's 3D space, drag left-right, up-down



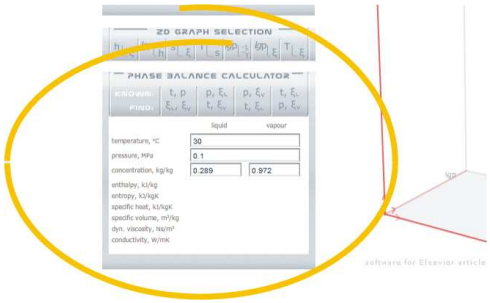

Press "h-ξ-lgp" button in 3D GRAPH SELECTION frame, that's first kind of 3D graph available, all 3D graphs are empty at this moment, only axes and their labels are visible



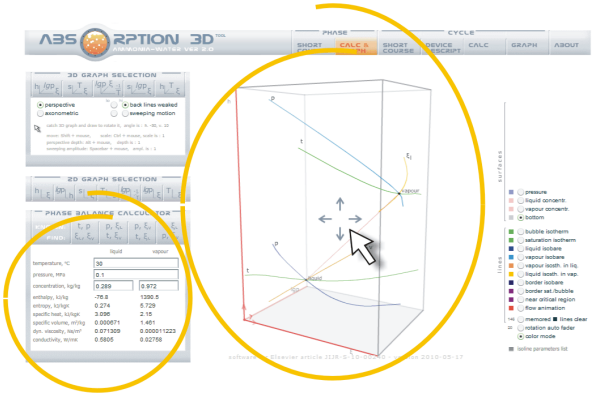
Look at 2D GRAPH SELECTION frame, press "h- ξ " button. Wait and see - 3D box is transforming to 2D box, try to use next buttons, see new boxes, all they are empty at this moment, only axis and their labels are visible, press "h- ξ -lgp" button again" to return to 3D view



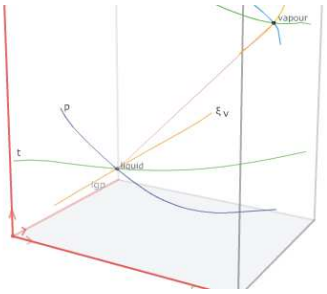

Look at left and bottom at PHASE BALANCE CALCULATOR, that's tool for calculation of phase balance according to written data



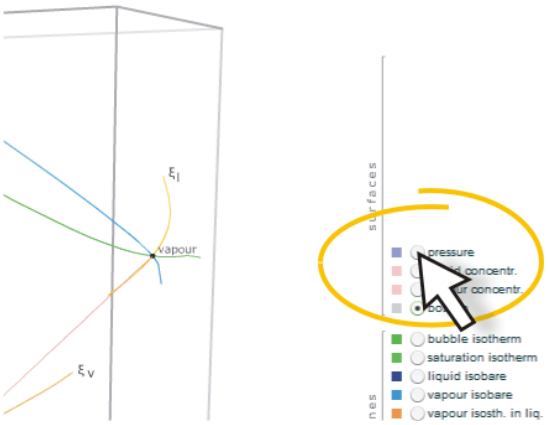

Press left button "t, p , ξ l, ξ v", wait for 3D view. Look at calculator frame - there are all main thermodynamic parameters presented. Look at 3D box - phases balance is visible, wait and see, try to drag the box, feel the 3D space

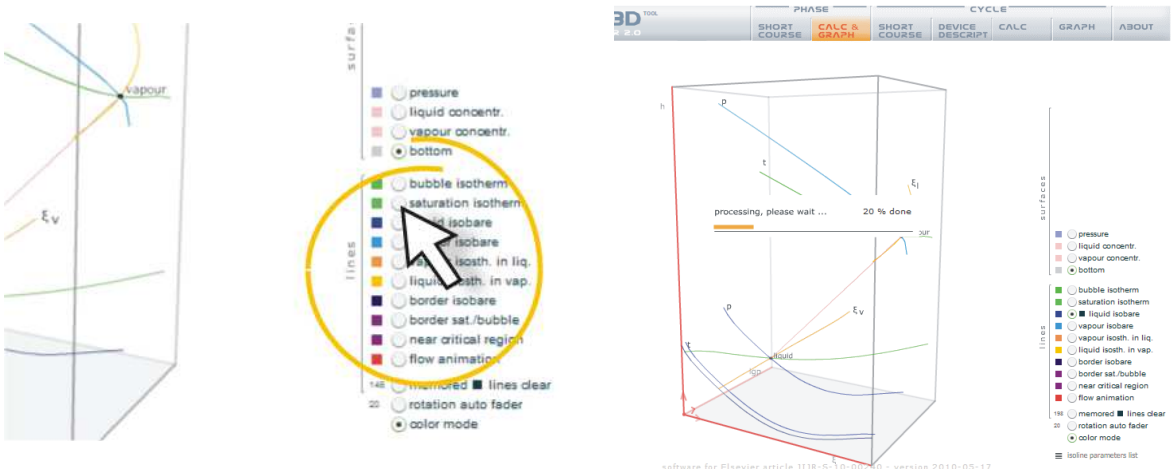

There are coloured lines on 3D view presented. Blue line means isobare, green means isotherm, yellow means isosthere, red represents spleeting of the phases balance



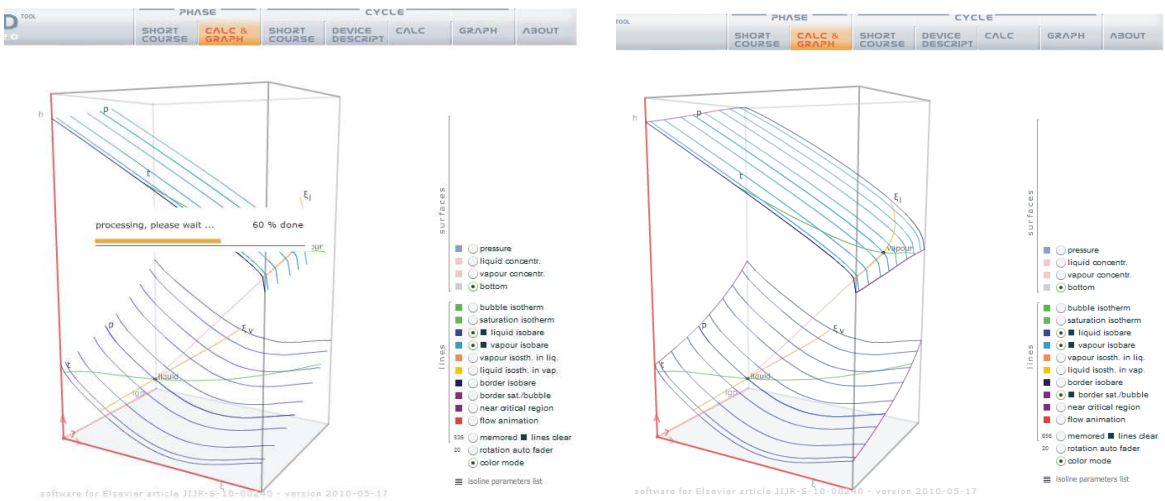
Look at right side of the screen at upper radios, press "pressure", look at the surface of constant pressure presented, turn it off, try another radios, move 3D box if needed



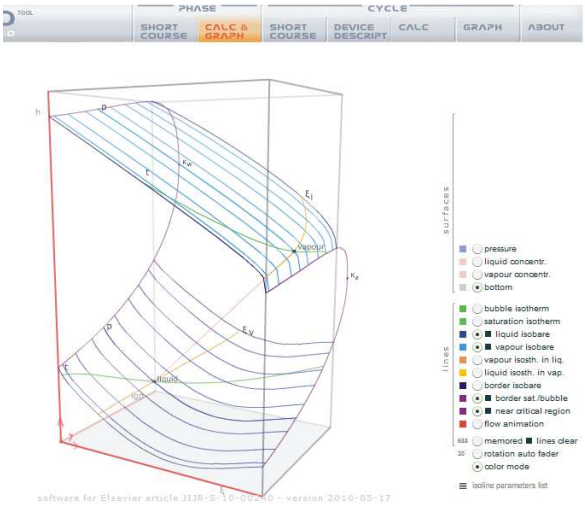

Look at the bottom radios of isolines collected, at first press "liqiud isobare", wait and see isobares presented on screen, don't turn-off the radio



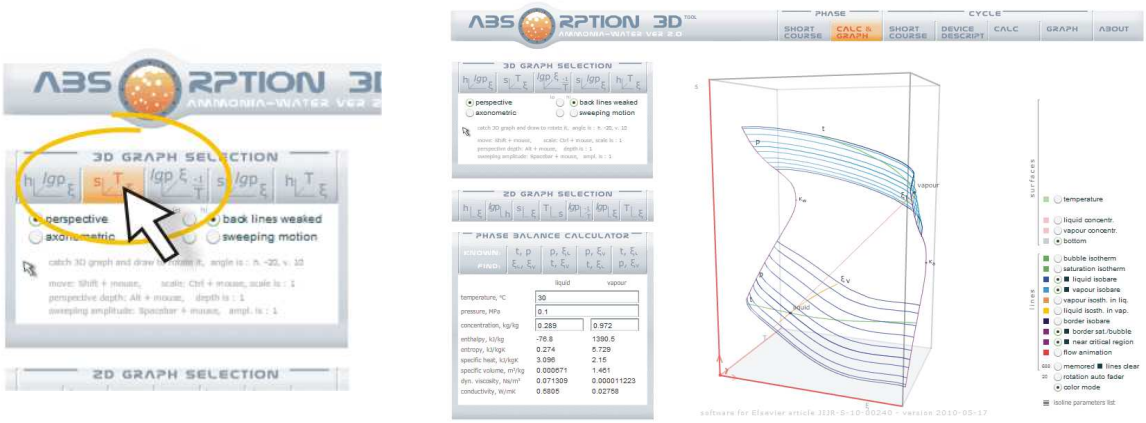

Press "vapour isobare", wait and see isobares presented, don't turn-off the radio



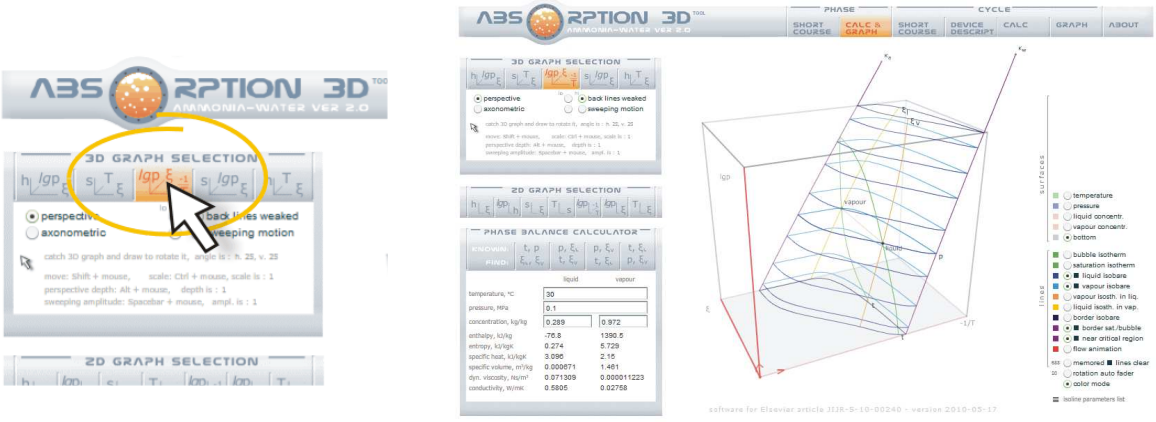
Press "border sat./bubble", wait and see saturation and bubble lines presented on screen, don't turn-off the radio, feel the 3D space, move the box if needed, still don't turn-off the radio



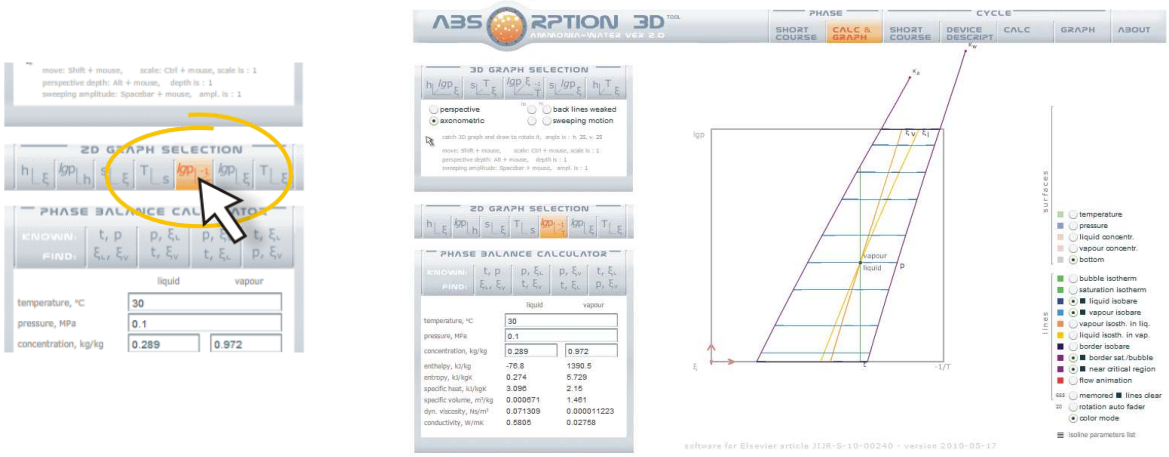

Up to this moment isobare lines are visible. You are still in the "h- ξ -lgp" graph, press "s- ξ -T" button, wait and see 3D space presented, recognize graph properties



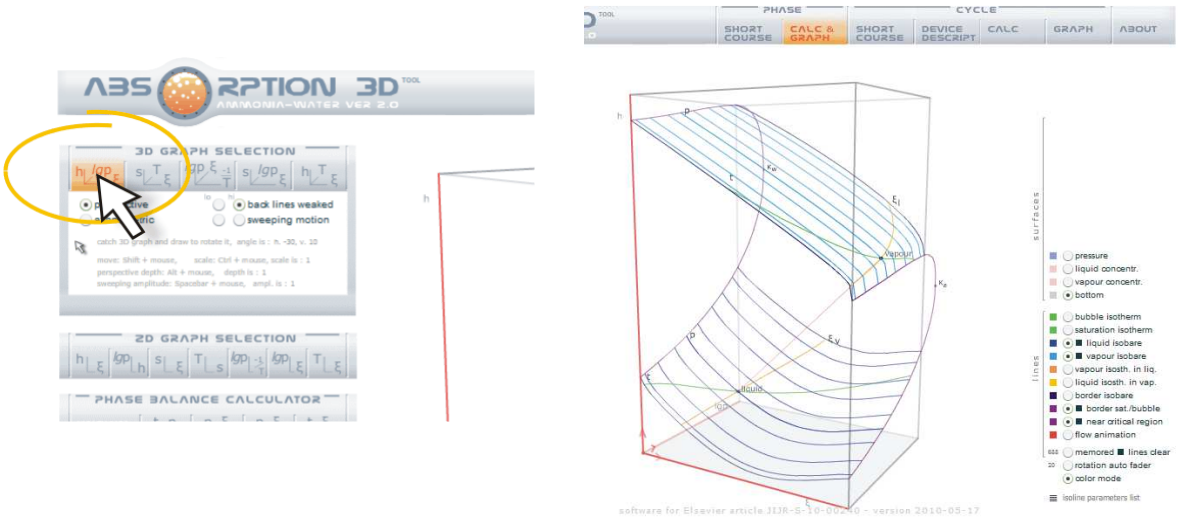

Press "lgp-1/T- ξ " button, wait and recognize graph properties



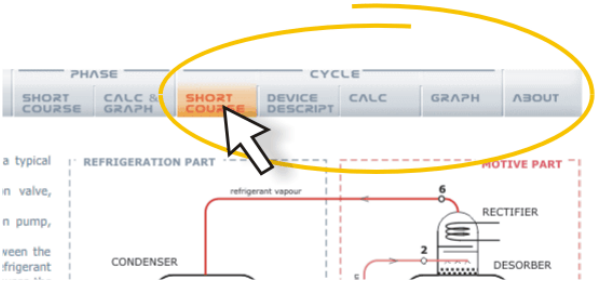
To transform 3D view, press "lgp-1/T" button on 2D GRAPH SELECTION frame, wait and recognize isobare lines presented. Try to use other buttons to see next 2D graphs.



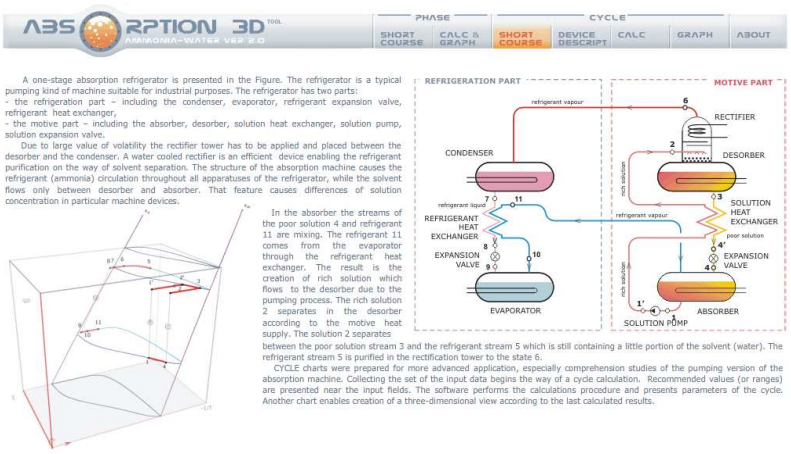
Press "h- ξ -lgp"  button again" to return to 3D view, press "border sat./bubble" radio, wait to complete, press "border isobare", wait to complete them, press "near critical region", wait to complete, feel thermodynamic 3D space of phases balance on this graph,
You may also press "s- ξ -T" button and feel thermodynamic 3D space of phases balance on this graph, press "lgp-1/T- ξ " button and feel 3D space of phases balance on this graph



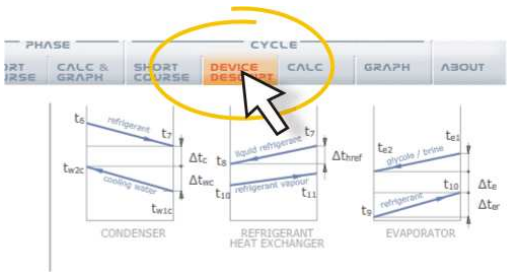
Return to upper bar, go to CYCLE part,

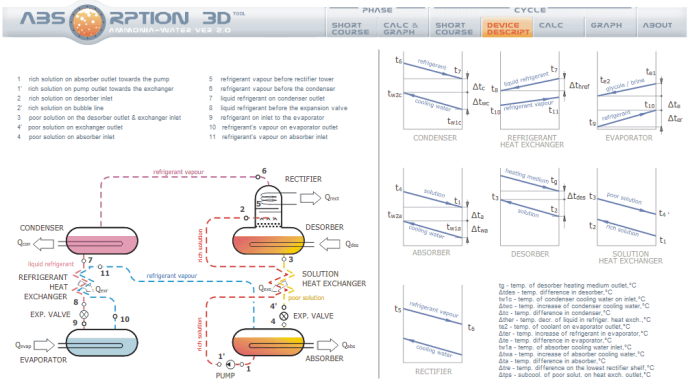


Press SHORT COURSE button, entrance text is presented, read it

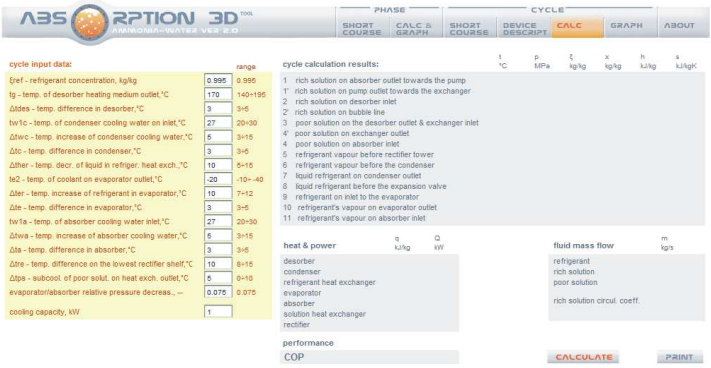



Press DEVICE DESCRIPT button, look at animation, devices and points description,



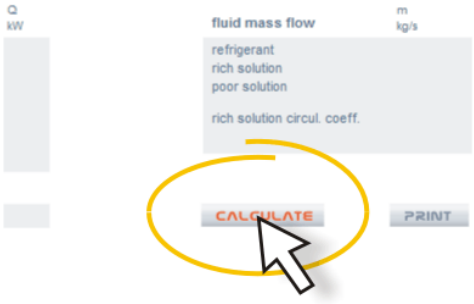



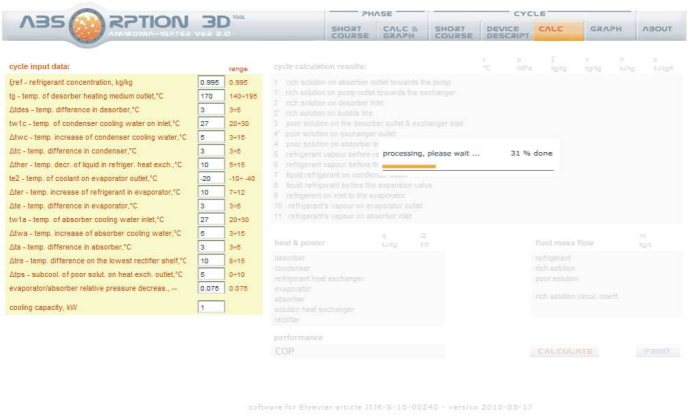

Press CALC button, there is main part of cycle calculation. On left side there are input datas collected, on right side you can see only empty place of results. Be aware of data value, the cycle parameters have to keep between some ranges. On the right side of datas frame a set of recommended values is presented.

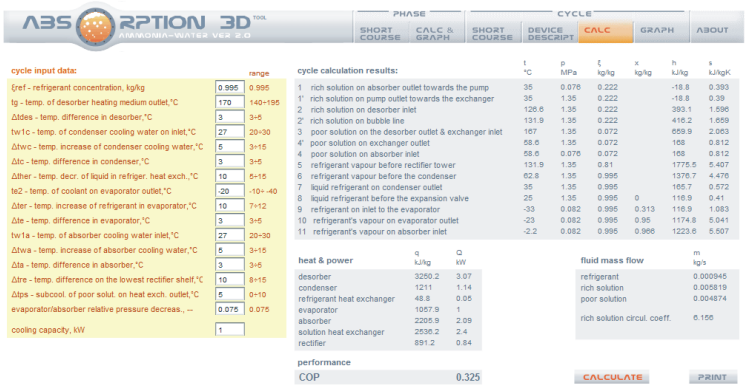




CYCLE

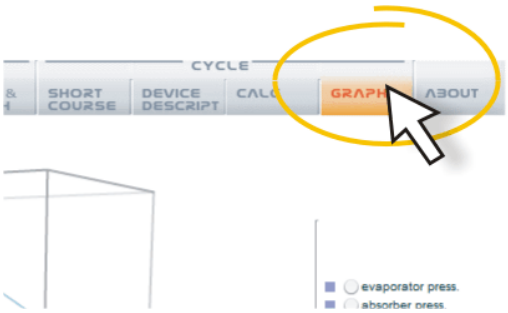
Press CALCULATE button on the bottom of that screen, wait for results, look at calculated values. If you wish to return to point's name or cycle animation you may press DEVICE DESCRIPT button again.

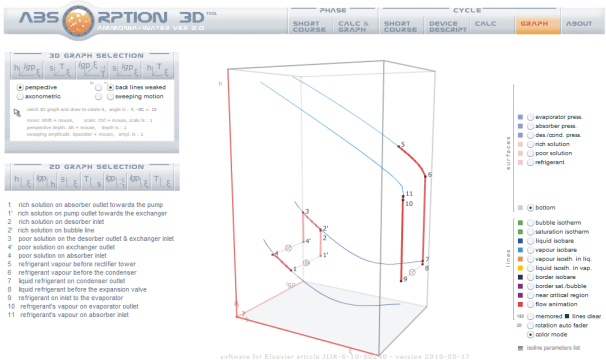



Press GRAPH button. Look at 3D box of cycle calculated. Wait and recognize cycle points presented at first on h- ξ - lgp graph

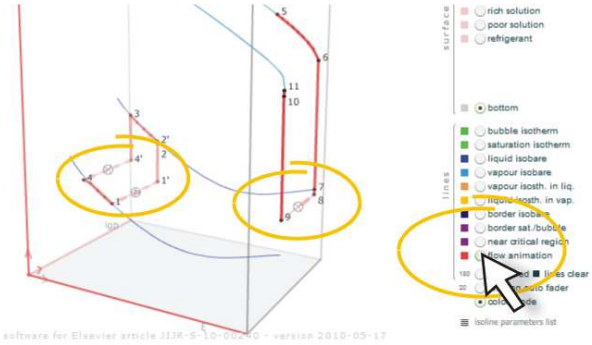


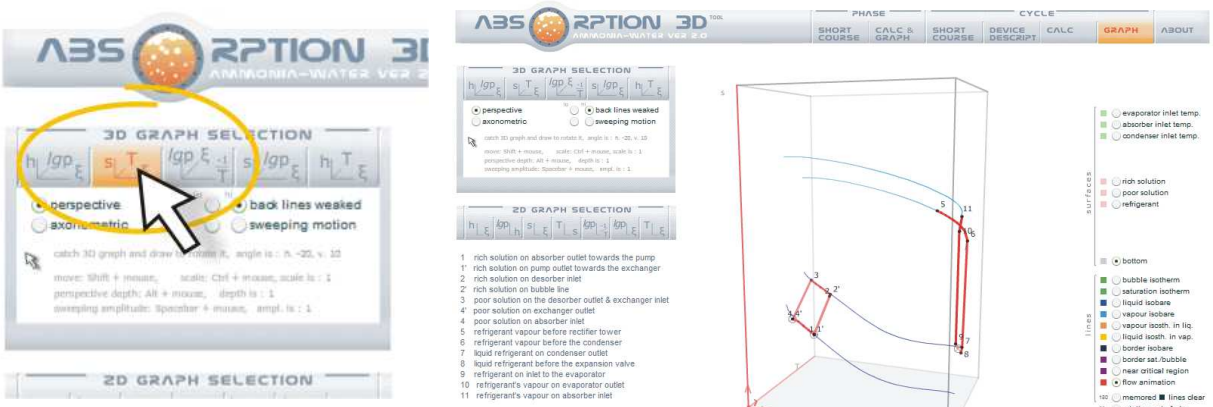


CYCLE

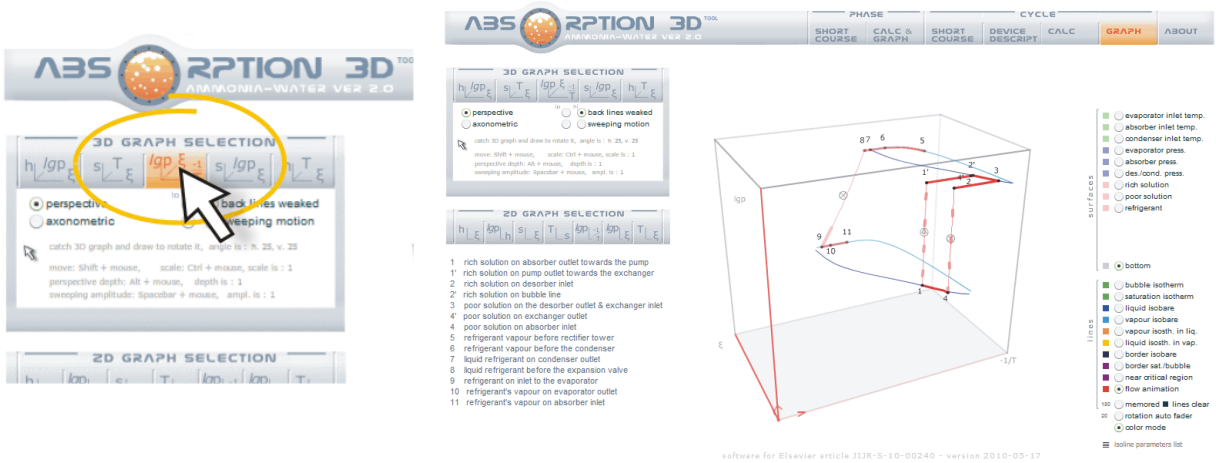
Press "flow animation" radios and look at animation, press again to switch it off,



Press "s-ξ-T" button and recognize cycle points on this graph



Press "lgp-1/T- ξ " button and recognize cycle points on this graph



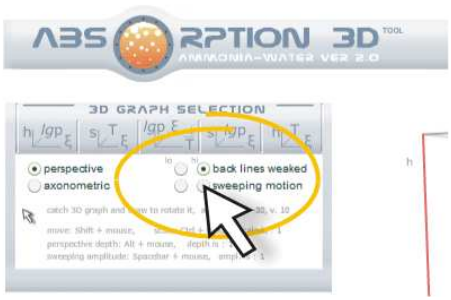
**Rules and options**

You may add some isolines to graph, you may transform 3D view to 2D view according to the button pressed.
To enlarge the view - press "CTRL" key and drag the mouse right-left,
To move the view - press "SHIFT" key and drag the mouse right-left, up-down,
To change properties of the perspective used - press "ALT" key and drag the mouse right-left,

If many isolines are used, you can see many black box signs on the right side of the screen near the radios. It means the many lines are stored in processor memory. It slows down rotation of 3D view when you drag and move it. If it's a trouble press "memored lines clear" radio. All isolines collected up to this moment are cleared. Speed of of the view motion should increase.


Procesor of the computer used should by really good. More then 1,6GHz of the procesor's clock speed is recommended. Two cores makes the calculation speed better. To see the procesor's engagement degree look at the orange coloured animation of desorber on the upper bar. If bubbles flow up, the procesor speed is fulfilling all demands. When bubbles stop - the procesor is working very hard.


Press "sweeping motion" radio on 3D GRAPH SELECTION (left, upper frame), wait 10 sec and look at full motion. Press "sweeping motion" again and wait, the box motion is slows down and stops at the end.



Look at the upper bar and press ABOUT button, there is the software description text.



That's all.

**The software *Absorption 3D tool* and tutorial have been prepared for submission "Ammonia-water absorption cycle on three-dimensional graphs - The Absorption 3D tool software" - manuscript number JIJR-D-10-00172.**

**Tutorial version 2010-05-20**
**Software version 2010-05-19**
**available at http://www.itcimp.pwr.wroc.pl/absorption3d/**

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ABOUT