

VITESS 3.0

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on behalf of the
VITESS HZB Team

VITESS 3.0 RELEASE

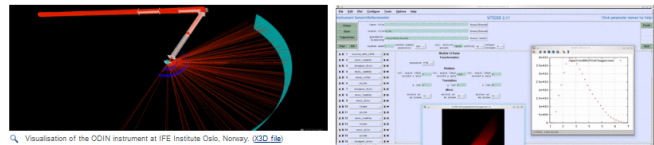
- Vitess 3.0 was officially released on 23.11.12
- Step in version number from 2.11 to 3.0, because
 - It was promised! 😊
 - Main new feature: **Visualisation**
 - Other new features and improvements also included...

Vitess 3.0

- Windows Installer
38718214 byte, md5sum
9b1ebd15d5582957297995490e61b372
- Linux/Mac Tar-Ball
18232958 byte, md5sum
1363618f0ee333145b93fed7049c8f12
- Linux 7z archive
8110738 byte, md5sum
9d60a4db492b6a1daa26c268157db0b0

Since version 3.0 Vitess includes visualisation of instruments and neutron trajectories.

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VITESS 3.0: VISUALISATION

Xcontrol C:/Vites3_0

File Edit Plot Configure Tools Options Help

Instrument 1 VITESS 3.0 Click parameter names for help!

input file Browse BrowseN

output file Browse BrowseN

parameter directory Browse NewDir

random seed random number generator

min. neutron weight gravity helper threads

Check Dryrun

Start

Trajectories

Stop Kill

Fresh

Exit

Getting Help

You can get help about every

- parameter by clicking on its name (see also help for module)
- module by clicking on the module number or choosing the menu Help

Help

Alternatively, you can visit web pages at
<http://www.helmholtz-berlin.de/vitess>

For further questions, please send an email to vitess@helmholtz-berlin.de

Getting Started Tutorial

Inserting/Deleting a Module Visualising Results

Troubleshooting

default parameter file directory has been set to C:/Vites3_0

Big

Clear

Save

VISUALISATION DEMONSTRATION

VISUALISATION CONCEPT

- Visualisation of instrument components
 - Each component is defined by (a combination of) geometrical shapes like rectangles, circles, boxes etc...
 - Each module with implemented visualisation stores the geometrical information=geometry, including color
 - Each geometry is placed in the **global** coordinate system and then written to a common ascii file (geometry.inf)
 - Dedicated routine converts the geometry data to an .x3d file
 - Result: 3D model of the instrument

geometry.inf

```

DEF red=<Material diffuseColor='.9 .01 .01' emissiveColor='.9 .01 .01' transparency='.4'/>
DEF green=<Material diffuseColor='.01 .9 .01' emissiveColor='.01 .9 .01' transparency='.4'/>
DEF blue=<Material diffuseColor='.01 .01 .9' emissiveColor='.01 .01 .9' transparency='.4'/>
DEF yellow=<Material diffuseColor='.9 .6 .01' emissiveColor='.9 .6 .01' transparency='.3'/>
DEF orange=<Material diffuseColor='.9 .4 .01' emissiveColor='.9 .4 .01' transparency='.4'/>
DEF cyan=<Material diffuseColor='.0 .99 .99' emissiveColor='.0 .99 .99' transparency='.4'/>
DEF magenta=<Material diffuseColor='.9 .01 .6' emissiveColor='.9 .01 .6' transparency='.4'/>
DEF grey=<Material diffuseColor='.6 .6 .6' emissiveColor='.6 .6 .6' transparency='.4'/>
DEF black=<Material diffuseColor='.01 .01 .01' emissiveColor='.01 .01 .01' transparency='.4'/>
DEF white=<Material diffuseColor='.99 .99 .99' emissiveColor='.99 .99 .99' transparency='.4'/>
#
#units
# [m] position, length, width, height, radius
# [deg] angels
#
Rectangle 0.00000 0.00000 0.00000 1.00000 0.00000 0.00000 0.12000 0.12000 0.00000 source:yellow
Rectangle 0.00000 0.13000 0.00000 1.00000 0.00000 0.00000 0.12000 0.12000 0.00000 source:yellow
Rectangle 2.50000 0.00000 0.00000 1.00000 0.00000 0.00000 0.13000 0.08000 0.00000 source:yellow
Rectangle 2.50000 0.00000 0.03733 0.00906 0.00000 0.99996 1.00004 0.17100 90.00000 sm ensemble:green
Rectangle 2.50000 0.00000 -0.03733 -0.00906 0.00000 0.99996 1.00004 0.17100 90.00000 :green
Rectangle 2.50000 0.05900 0.00000 0.05234 0.99863 0.00000 1.00138 0.08400 0.00000 :green
Rectangle 2.10000 -0.01325 0.00000 0.02443 0.99970 0.00000 0.20004 0.12000 0.00000 :green
Rectangle 2.30000 -0.01796 0.00000 0.02269 0.99974 0.00000 0.20004 0.12000 0.00000 :green
Rectangle 2.50000 -0.02233 0.00000 0.02094 0.99978 0.00000 0.20004 0.12000 0.00000 :green
Rectangle 2.70000 -0.02634 0.00000 0.01920 0.99982 0.00000 0.20004 0.12000 0.00000 :green
Rectangle 2.90000 -0.03001 0.00000 0.01745 0.99985 0.00000 0.20004 0.12000 0.00000 :green
Rectangle 2.10000 0.00770 0.00000 0.02443 0.99970 0.00000 0.20004 0.12000 0.00000 :green
Rectangle 2.30000 0.00298 0.00000 0.02269 0.99974 0.00000 0.20004 0.12000 0.00000 :green
Rectangle 2.50000 -0.00138 0.00000 0.02094 0.99978 0.00000 0.20004 0.12000 0.00000 :green
Rectangle 2.70000 -0.00539 0.00000 0.01920 0.99982 0.00000 0.20004 0.12000 0.00000 :green
Rectangle 2.90000 -0.00906 0.00000 0.01745 0.99985 0.00000 0.20004 0.12000 0.00000 :green
Rectangle 2.10000 0.02864 0.00000 0.02443 0.99970 0.00000 0.20004 0.12000 0.00000 :green
Rectangle 2.30000 0.02393 0.00000 0.02269 0.99974 0.00000 0.20004 0.12000 0.00000 :green
Rectangle 2.50000 0.01957 0.00000 0.02094 0.99978 0.00000 0.20004 0.12000 0.00000 :green
Rectangle 2.70000 0.01555 0.00000 0.01920 0.99982 0.00000 0.20004 0.12000 0.00000 :green
Rectangle 2.90000 0.01189 0.00000 0.01745 0.99985 0.00000 0.20004 0.12000 0.00000 :green
Rectangle 2.10000 0.04959 0.00000 0.02443 0.99970 0.00000 0.20004 0.12000 0.00000 :green
Rectangle 2.30000 0.04488 0.00000 0.02269 0.99974 0.00000 0.20004 0.12000 0.00000 :green
Rectangle 2.50000 0.04051 0.00000 0.02094 0.99978 0.00000 0.20004 0.12000 0.00000 :green
Rectangle 2.70000 0.03650 0.00000 0.01920 0.99982 0.00000 0.20004 0.12000 0.00000 :green
Rectangle 2.90000 0.03283 0.00000 0.01745 0.99985 0.00000 0.20004 0.12000 0.00000 sm ensemble:green
Triangle 3.00067 -0.03279 0.04200 1.99933 -0.04187 -0.04200 2.00000 -0.04186 0.04200 sm ensemble:green
Triangle 3.00067 -0.03279 0.04200 1.99933 -0.04187 -0.04200 3.00067 -0.03279 -0.04200 sm ensemble:green
Hu11 3.02500 0.00000 0.00000 1.00000 0.00000 0.00000 0.05000 0.06570 0.06519 0.06570 0.06519 0.00000 guide:yellow
Hu11 3.07500 0.00000 0.00000 1.00000 0.00000 0.00000 0.05000 0.06519 0.06469 0.06519 0.06469 0.00000 :yellow
Hu11 3.12500 0.00000 0.00000 1.00000 0.00000 0.00000 0.05000 0.06469 0.06418 0.06469 0.06418 0.00000 :yellow
Hu11 3.17500 0.00000 0.00000 1.00000 0.00000 0.00000 0.05000 0.06418 0.06367 0.06418 0.06367 0.00000 :yellow
Hu11 3.22500 0.00000 0.00000 1.00000 0.00000 0.00000 0.05000 0.06367 0.06315 0.06367 0.06315 0.00000 :yellow
Hu11 3.27500 0.00000 0.00000 1.00000 0.00000 0.00000 0.05000 0.06315 0.06263 0.06315 0.06263 0.00000 :yellow
Hu11 3.32500 0.00000 0.00000 1.00000 0.00000 0.00000 0.05000 0.06263 0.06211 0.06263 0.06211 0.00000 :yellow
Hu11 3.37500 0.00000 0.00000 1.00000 0.00000 0.00000 0.05000 0.06211 0.06158 0.06211 0.06158 0.00000 :yellow
Hu11 3.42500 0.00000 0.00000 1.00000 0.00000 0.00000 0.05000 0.06158 0.06105 0.06158 0.06105 0.00000 :yellow
Hu11 3.47500 0.00000 0.00000 1.00000 0.00000 0.00000 0.05000 0.06105 0.06051 0.06105 0.06051 0.00000 :yellow
Hu11 3.52500 0.00000 0.00000 1.00000 0.00000 0.00000 0.05000 0.06051 0.05996 0.06051 0.05996 0.00000 :yellow
Hu11 3.57500 0.00000 0.00000 1.00000 0.00000 0.00000 0.05000 0.05996 0.05942 0.05996 0.05942 0.00000 :yellow
Hu11 3.62500 0.00000 0.00000 1.00000 0.00000 0.00000 0.05000 0.05942 0.05886 0.05942 0.05886 0.00000 :yellow
Hu11 3.67500 0.00000 0.00000 1.00000 0.00000 0.00000 0.05000 0.05886 0.05830 0.05886 0.05830 0.00000 :yellow
    
```

```

geom_1 - Notepad
File Edit Format View Help
<?xml version="1.0" encoding="UTF-8"?>
<!DOCTYPE X3D PUBLIC "ISO//Web3D//DTD X3D 3.0//EN" "http://www.web3d.org/specifications/x3d-3.0.dtd">
<X3D profile='Interactive' version='3.0' xmlns:xsd='http://www.w3.org/2001/XMLSchema-instance' xsd:noNamespaceSchemaLocation='http://www.wel
<head>
<meta content='VITESS experiment geometry plus trajectories' name='editors'/>
</head>
<Scene>
<NavigationInfo type="EXAMINE" ANY"/>
<Transform scale='.06 .06 1' rotation='0 1 0 1.5708' translation='0 0 0'><Shape DEF='rectangle'><Rectangle2D/><Appearance><Material diffuseColor='0.1 0.1 0.9' emissiveColor='.1 .1 .33'
transparency='.5'/></Appearance></Shape></Transform>
<Transform translation='0 0 0'><Billboard><Shape><Appearance DEF='label_appearance'><Material diffuseColor='1 1 .3' emissiveColor='.33 .33 .1'/></Appearance><Text string='Source'><FontStyle
DEF='label_font' family='SANS' justify='MIDDLE' MIDDLE" size='.1'/></Text></Shape></Billboard></Transform>
<Transform scale='.06 .06 1' rotation='0 1 0 1.5708' translation='0 0 -.13'><Shape USE='rectangle'></Transform>
<Transform translation='0 0 -.13'><Billboard><Shape><Appearance USE='label_appearance'><Text string='Source'><FontStyle USE='label_font'></Text></Shape></Billboard></Transform>
<Transform scale='.065 .04 1' rotation='0 1 0 1.5708' translation='2.5 0 0'><Shape USE='rectangle'></Transform>
<Transform translation='2.5 0 0'><Billboard><Shape><Appearance USE='label_appearance'><Text string='Source'><FontStyle USE='label_font'></Text></Shape></Billboard></Transform>
<Transform scale='.0855 .0855 1' rotation='- .99996 .00906 0 1.5708' translation='2.5 .03733 0'><Transform rotation='0 0 1 1.5708'><Shape><Rectangle2D/><Appearance><Material
diffuseColor='.01 .9 .01' emissiveColor='.01 .9 .01' transparency='.4'/>
</Appearance></Shape></Transform></Transform>
<Transform translation='2.5 .03733 0'><Billboard><Shape><Appearance USE='label_appearance'><Text string='sm ensemble'><FontStyle USE='label_font'></Text></Shape></Billboard></Transform>
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</Appearance></Shape></Transform>
<Transform scale='.06 .06 1' rotation='0 .02443 0 3.11716' translation='2.1 0 -.02864'><Shape><Rectangle2D/><Appearance><Material diffuseColor='.01 .9 .01' emissiveColor='.01 .9 .01'

```

geometry.x3d

VISUALISATION CONCEPT

- Visualisation of neutron trajectories
 - Each component writes out locations in the instrument, at which:
 - Neutrons enter, exit and interact with the component
 - Data is combined and written to an ascii file
 - Dedicated routine stores the trajectories in the same x3d file
- Planned: Visualisation of a subset of neutrons
- Apart from visualisation, other applications are possible, e.g. background estimations

VISUALISATION CONCEPT

```

# Trajectories
#
# units
# [m] position
# [Ang] lambda
# [n/s] weight
#
# ID      color  lambda  weight  pos_x  pos_y  pos_z  spin  rsn
AA0000000001  0  0.81370  0.000e+000  3.00000  -0.02551  0.01780  -1  4
AA0000000002  0  3.13384  0.000e+000  3.00000  -0.01530  0.01335   1  4
AA0000000003  0  8.41722  0.000e+000  3.00000   0.02339  0.00525  -1  4
AA0000000004  0  5.57237  0.000e+000  3.00000   0.02444  0.00682   1  4
AA0000000006  0  8.06436  0.000e+000  3.00000  -0.06541  0.01542  -1  4
AA0000000008  0  8.57656  0.000e+000  3.00000   0.02116  -0.01200  -1  4
AA0000000011  0  1.46195  0.000e+000  3.00000  -0.01955  0.02350   1  4
AA0000000012  0  9.84761  0.000e+000  3.00000  -0.00004  0.02680  -1  4
AA0000000013  0  2.37445  0.000e+000  3.00000   0.01268  -0.00232   1  4
AA0000000014  0  5.78258  0.000e+000  3.00000  -0.01837  0.03048  -1  4
AA0000000016  0  4.56912  0.000e+000  3.00000  -0.01166  0.01862  -1  4
AA0000000018  0  6.61643  0.000e+000  3.00000   0.02531  0.02845   1  4
AA0000000019  0  8.56054  0.000e+000  3.00000   0.01422  0.02910   1  4
AA0000000021  0  8.19619  0.000e+000  3.00000   0.02066  0.01093   1  4
AA0000000022  0  9.80664  0.000e+000  3.00000   0.02821  -0.03128   1  4
AA0000000023  0  2.13285  0.000e+000  3.00000   0.01497  0.02871   1  4
AA0000000025  0  6.11253  0.000e+000  3.00000   0.03262  0.02276   1  4
AA0000000026  0  4.59034  0.000e+000  3.00000   0.02878  -0.03035   1  4
AA0000000028  0  6.97215  0.000e+000  3.00000  -0.02470  -0.02452   1  4
AA0000000031  0  7.17883  0.000e+000  3.00000  -0.00932  -0.02259   1  4
AA0000000033  0  6.23188  0.000e+000  3.00000   0.02564  -0.02702   1  4
AA0000000034  0  2.31945  0.000e+000  3.00000  -0.05827  -0.00877  -1  4
AA0000000035  0  5.44885  0.000e+000  3.00000  -0.01688  -0.02942  -1  4
AA0000000036  0  9.44954  0.000e+000  3.00000  -0.02681  -0.00125  -1  4
AA0000000037  0  0.88671  0.000e+000  3.00000   0.02074  0.00593  -1  4
AA0000000038  0  9.12905  0.000e+000  3.00000   0.00837  -0.00576   1  4
AA0000000039  0  8.49515  0.000e+000  3.00000   0.01042  -0.01595  -1  4
AA0000000040  0  8.35689  0.000e+000  3.00000  -0.02026  0.01322   1  4
AA0000000041  0  8.65204  0.000e+000  3.00000  -0.02705  0.01593  -1  4
AA0000000045  0  6.66208  0.000e+000  3.00000   0.03252  0.02971   1  4
AA0000000046  0  0.53271  0.000e+000  3.00000  -0.04542  -0.02534  -1  4
AA0000000047  0  9.98325  0.000e+000  3.00000   0.01998  -0.01051  -1  4
AA0000000049  0  6.05058  0.000e+000  3.00000   0.01614  0.00621   1  4
AA0000000051  0  1.39879  0.000e+000  3.00000   0.02962  0.00479   1  4

```

Trajectory file

VITESS 3.0: ELLIPTIC GUIDE MODULE

- Elliptic guides have recently received a lot of attention, appears to be a good solution for long guides, e.g., at the ESS
- Until VITESS 3.0: Guides are comprised of interpolated segments for all shapes
- L. Cussen et al. (to appear in NIM A, <http://www.sciencedirect.com/science/article/pii/S0168900212015306>): Propagation in elliptic guides is **very** sensitive to deviations from ideal flight paths
- → Segmentation introduces artifacts
- Solution: Dedicated module describing propagation in elliptic guides analytically (in one or both dimensions)
- Speeds up calculations up to 2-3 orders of magnitude (for segmentation of the order of 1cm)!
- Yields results in agreement with the conventional guide module

VITESS 3.0: ELLIPTIC GUIDE MODULE

The screenshot displays the VITESS 3.0 software interface. At the top, the window title is "Xcontrol C:/Vite3_0". The menu bar includes File, Edit, Plot, Configure, Tools, Options, and Help. The main title bar reads "Instrument 1 VITESS 3.0" with a note "Click parameter names for help!".

On the left side, there are control buttons: Check, Dryrun, Start, Trajectories, Stop, and Kill. The main configuration area includes:

- input file: [text field] Browse BrowseN
- output file: no_file [text field] Browse BrowseN
- parameter directory: C:/Vite3_0 [text field] Browse NewDir
- random seed: 1 [text field] random number generator: ran3 [dropdown]
- min. neutron weight: 1.0e-25 [text field] gravity: on [checkbox]
- helper threads: 0 [text field]

On the right side, there are buttons for Fresh and Exit.

The main configuration panel is titled "Module 1 guide_ideal" and "Shape and size of guide". It contains the following parameters:

- horizontal shape: constant [dropdown]
- vertical shape: constant [dropdown]
- guide shape: guide_shape.dat [text field] Browse BrowseN Edit Plot AutoPlot
- Major ellipse axis in x-y plane [m]: 0 [text field]
- Minor ellipse axis in x-y plane [m]: 0 [text field]
- Major ellipse axis in x-z plane [m]: 0 [text field]
- Minor ellipse axis in x-z plane [m]: 0 [text field]
- entrance width [cm]: 6 [text field]
- entrance height [cm]: 10 [text field]
- exit width [cm]: 6 [text field]
- exit height [cm]: 10 [text field]
- Guide length [m]: 0 [text field]
- Distance from exit to focus in hor. plane [m]: 0 [text field]
- Distance from exit to focus in ver. plane [m]: 0 [text field]
- Add to color: 0 [text field]

At the bottom left, there are buttons for Big, Clear, and Save. A status bar at the bottom indicates "default parameter file directory has been set to C:/Vite3_0".

VITESS 3.0: OTHER FEATURES

- Brilliance monitor, brilliance used a lot for guide layout comparisons
- Generic 1D and 2D monitors
 - 2D monitor allows for arbitrary parameter combination
- New sources: FRM-2, ESS updated
- Re-import of pipes, e.g., from cluster jobs
- Transition mode for the monochromator
- Incoherent background for reflectometer sample
- Guides and sm_ensemble count reflections, guides discriminate between x-y and x-z plane
- ...

OUTLOOK

- Plan to release Vitess 3.1 in the first half of 2013
- Main foreseen changes:
 - Completion of visualisation
 - Optimization framework
 - Support of splitted cluster jobs
 - Detector: Event mode, compound geometry
 - Tool for design of extraction systems
 - GUI...
- Hope to collect feedback from users, in particular on visualisation issues
- VITESS went Facebook! 😊

The screenshot shows the Facebook profile page for 'Vitess software'. The page header includes the Facebook logo, a search bar with the text 'Suche nach Personen, Orten und Dingen', and the user's profile 'Vitess software' with a 'Startseite' dropdown menu. The main profile area features a cover photo of a particle detector, a profile picture of a logo with a stylized 'n', and the name 'Vitess software' with 11 likes and 1 comment. Below the profile information is a description: 'Produkt/Dienstleistung' with links to 'http://www.wikipedia.org/vitess' and 'http://www.helmholtz-berlin.de/impressum_en.html'. The page is divided into three columns: a left column with a 'Status' section containing a post about a 'Veranstaltung, Meilenstein +' and a post from 'Vitess software' about a new VITESS release; a middle column with a 'Höhepunkte' dropdown; and a right column with a '„Gefällt mir“-Angaben' section listing 'European Spallation Source ESS AB', 'McStas', and 'Helmholtz-Zentrum Berlin', and an 'Aktivitäten' section.

facebook Suche nach Personen, Orten und Dingen Vitess software Startseite

Seite erstellen

Jetzt
November
2012
Erstellt

 **Vitess software**
11 „Gefällt mir“-Angaben · 1 sprechen darüber

Produkt/Dienstleistung
<http://www.wikipedia.org/vitess>, Impressum: http://www.helmholtz-berlin.de/impressum_en.html

Info Fotos „Gefällt mir“-Angaben

Höhepunkte

Status Foto/Video

Veranstaltung, Meilenstein +

Was machst du gerade?

 **Vitess software**
vor 2 Minuten

Important information fpr people using VITESS for ESS instruments: The new cold moderator description is included in the new VITESS release, simply select source --> source_ESS_2012!

Gefällt mir · Kommentieren · Teilen

„Gefällt mir“-Angaben

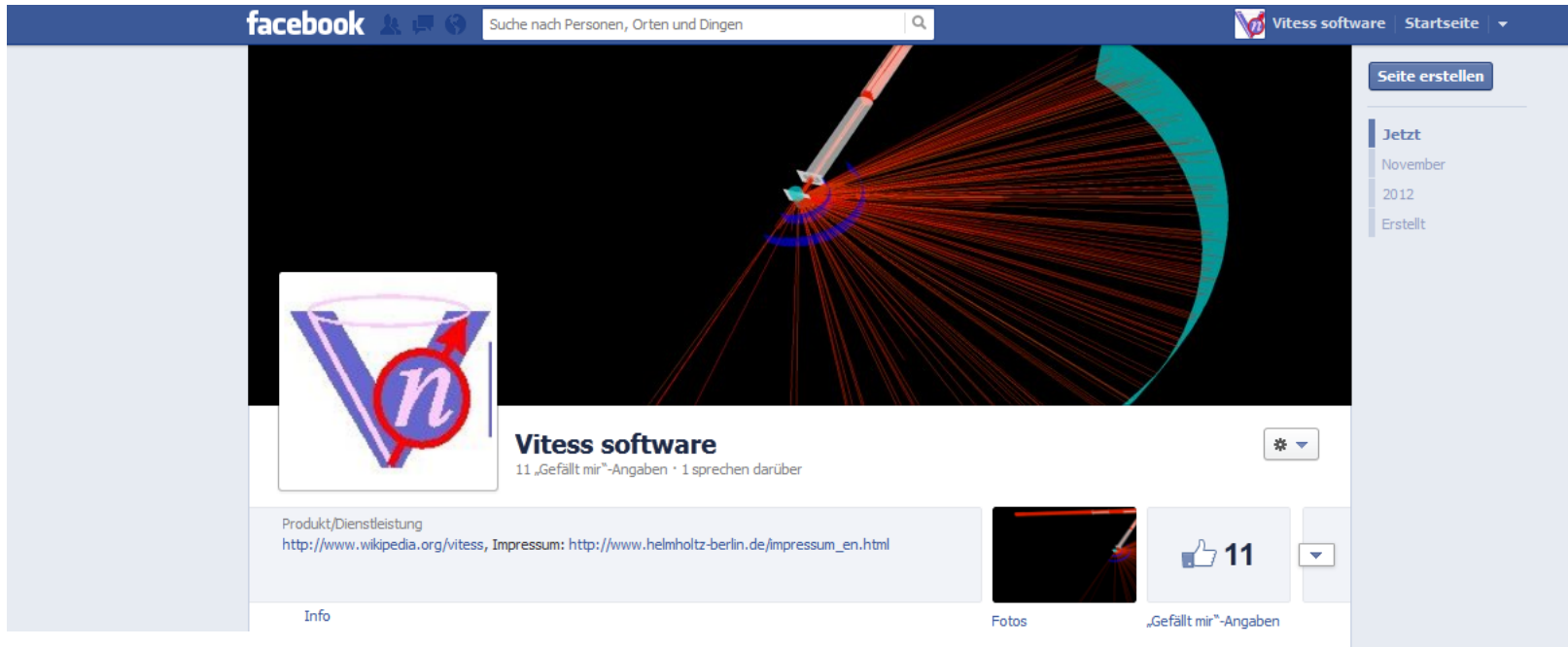
 **European Spallation Source ESS AB**
Regierungsinstitution

 **McStas**
Produkt/Dienstleistung

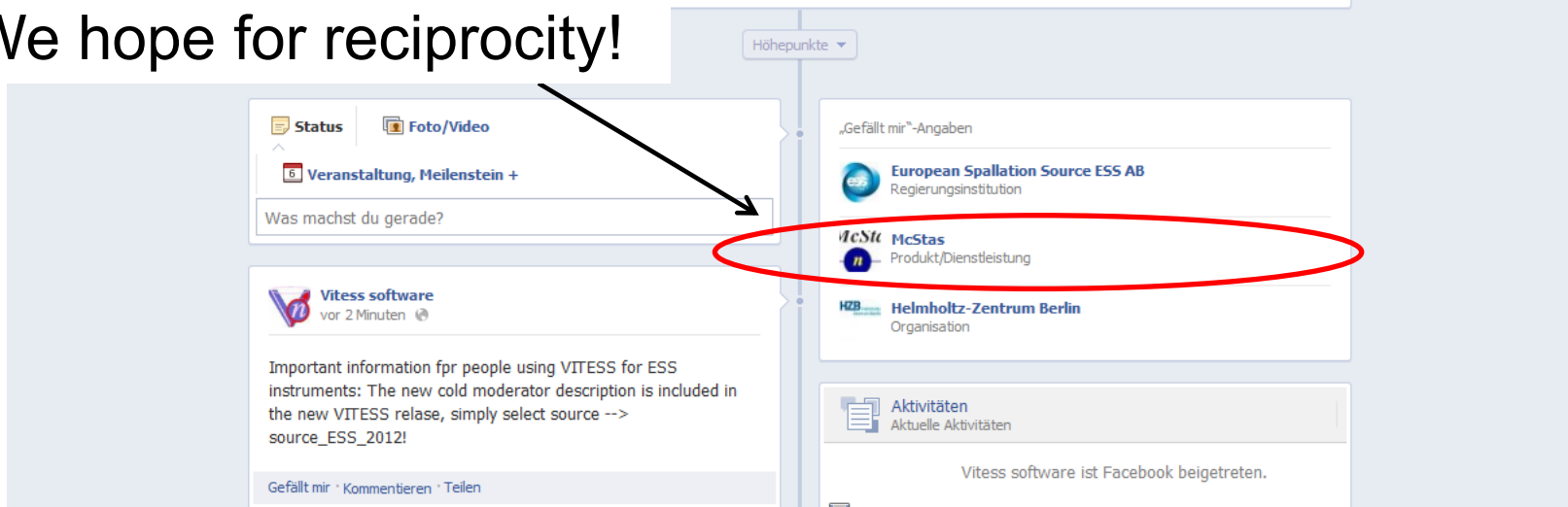
 **Helmholtz-Zentrum Berlin**
Organisation

Aktivitäten
Aktuelle Aktivitäten

Vitess software ist Facebook beigetreten.



We hope for reciprocity!



THANK YOU FOR YOUR ATTENTION

VITESS HZB TEAM

Carolin Zendler, Daniil Nekrassov, Michael Fromme, Klaus Lieutenant

Contributing

Andreas Houben (FZJ), Sergei Manoshin (JINR), Alexander Joffe(JCNS),
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