

## Designed with Dlubal-Software...

### Supporting Structure for a Railway Bridge

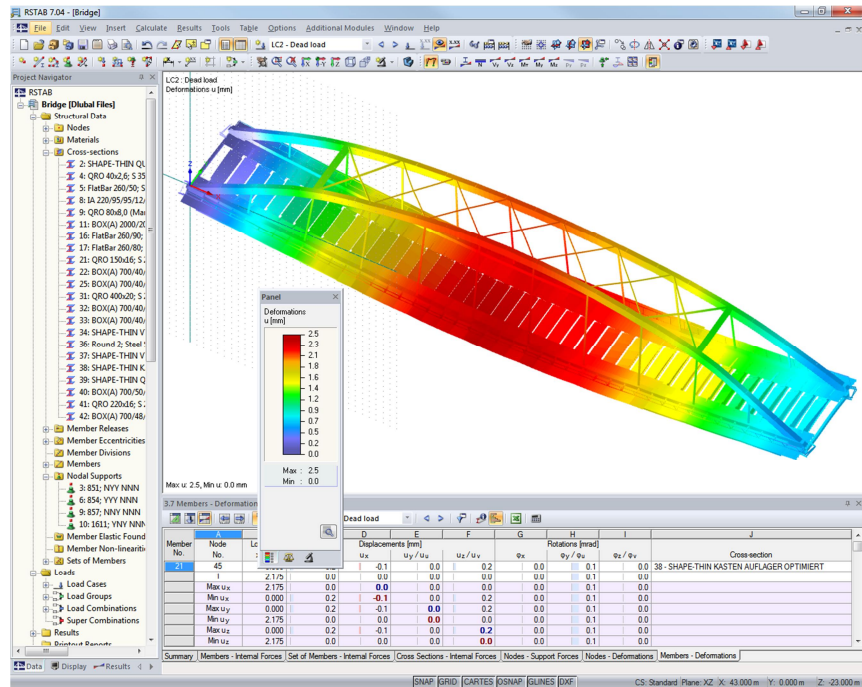
Due to their usability both programs for structural analysis RFEM and RSTAB are quite popular with students becoming future civil engineers. Many universities and schools of higher education are already using Dlubal's 3D calculation software to make their students familiar with the program handling. Radoslav Dimitrov who is studying at the TU Dresden in Germany used the framework program RSTAB to perform the structural analysis for a steel bridge.

### Definition of Paper Topic

The paper's objective was the design of a new construction replacing a railway bridge, including a superstructure consisting of a steel or composite structure. The design was performed with an arched bridge. It was necessary to develop a specific superstructure in accordance with the terrain conditions, actions, materials and dimensions. Based on the design, the student had to carry out a structural calculation which would be prepared for test engineers checking the analysis. Finally, the complete design had to be visualized.

### Structural Analysis of Railway Bridge

The structure of the arched bridge with a span length of 88.3 m was entered in RSTAB. Cross-sections previously modeled in the add-on module SHAPE-THIN were used as well. The overall structure consists of altogether 2,461 members. In addition, 198 load cases, 11 load groups and 8 load combinations were created. Finally, the system was calculated



Representation of deformation in 3D rendering

according to the second-order analysis.

The following add-on modules were used:

- STEEL
- PLATE-BUCKLING
- DYNAM
- RSBUCK
- RSIMP

Further data of bridge structure:

- Nodes: 1,318
- Cross-sections: 22
- Weight: 824 t

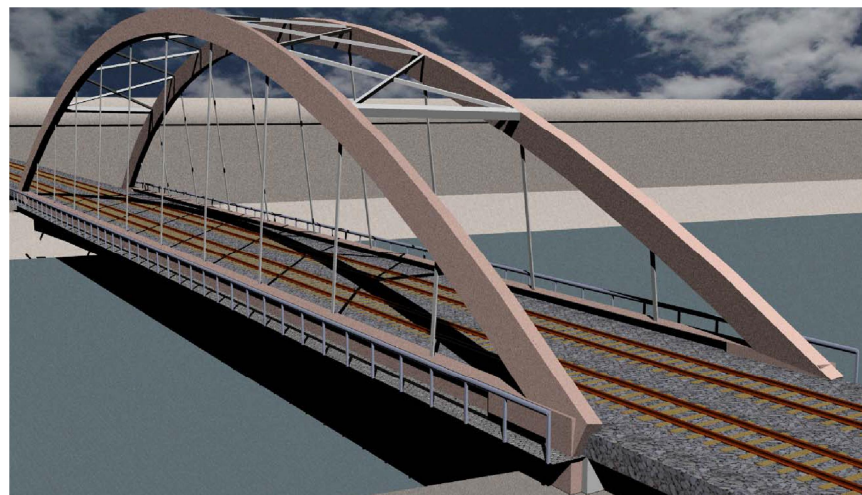
### Designer

Radoslav Dimitrov  
Student of civil engineering at the  
Technical University in Dresden

### Software

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Radoslav Dimitrov about RSTAB:  
"It was easy to enter traffic loads and to apply imperfections to the arches. Furthermore, the design ratio could be clearly represented in the 3D rendering. The program handling of RSTAB is easier than of other structural analysis software."



Visualization of railway bridge in the modeling tool Rhinoceros