Soft sediment deformation structures induced by the propagation of seismic waves (seismites) attract the attention of scientists all over the world for over hundred years. Studies on such type of structures includes the documentation of structures suggesting seismic activity, as well as laboratory experiments and computer simulations. So far, scientists have managed to establish few facts concerning seismites. We know that they form at a distance not further than 40 kilometers from the earthquake epicenter, while their spatial distribution is associated with the magnitude of this phenomena. Their geometry and size varies and depend mainly on physical properties of medium in which the seismic waves propagates. Those and other features make them invaluable source of information about the past earthquakes but they are also used for estimations of modern seismic events effects. However, despite their importance and continual efforts of scientists all over the world, those structures still remain the mystery. First, the issue which is still being under debated is the possibility of seismites recognition among the structures of different origin. Their recognition criteria are based on subjective observations and interpretations of research teams rather than on objective basis related to the process of their formation. Such situation indicates that many studies concerning the reconstruction of past seismic events are still considered as unreliable. It is not entirely know does the process of seismites formation go. Despite we know that the key agent in their formation is liquefaction and liquidization, the exact description of this phenomena still remains undiscovered. That’s why the further studies on deformation structures related with seismic waves propagation seems to be the urgent need of world science.

In earth science we are often dealing with the situation in which the direct observation of interesting phenomena is very difficult or even impossible. This is also the case of seismites formation process due to their development during the earthquakes. In such cases, the only possibility to see studied phenomena is to use laboratory experiments and computer simulations allowing to track the process in controllable conditions. Those are the research methods used in the frame of this project, the purpose of which is the development of comprehensive numerical model of seismic waves propagation through the unconsolidated medium and related with it appearing of deformation structures. Planed computer simulations and laboratory experiments together with field data will provide the opportunity to observe the process of seismites formation and to describe it in details. The variety of conducting research during which laboratory and numerical experiments together with field data will consist the complementary picture, will be based on complementarity of results obtained by different scientific methods. It is assumed that proposed project will not only contribute in the clarification of seismites recognition criteria, but will also allow the better understanding of earthquakes physics. Furthermore, it will provide the opportunity for the revision of previous observations and interpretations concerning past seismic events. During the project, the numerical code enables to conduct computer simulations addressing the physical process of seismites formation will be developed and shared with the scientific community. The research project will be carry out in the cooperation with a leading research centers in Germany, what will influence significantly the international cooperation development.