

## OS1-4

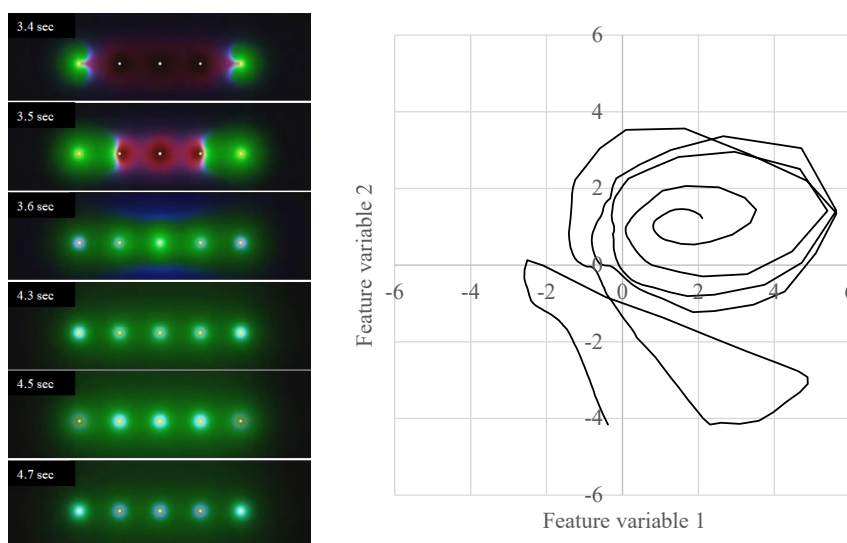
# PHOENIX-2, -複数液滴の冷炎ダイナミクス-, 状況報告

## PHOENIX-2, -Cool Flame Dynamics of Multiple droplets-, Status Report

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The Japan-German joint project on the cool flame dynamics is ongoing as PHOENIX-2 project. Spontaneous ignition process of multiple droplets aligned on an axis is going to be tested using TEXUS sounding rocket. Japanese team is developing the experimental module and an advanced numerical simulation model. The design of the apparatus is completed and some parts are in production. The interface design to the rocket is also in progress, working together with German partners. The simulation model now successfully include the transient heat up process of droplets interior, in addition to the detailed chemical reaction calculation in gas phase that is essential to reproduce cool flame. These status of the developments is presented. In addition to the planned progress, a novel analysis method for the modeling of the dynamics of reacting flow field is under development. To find an appropriate phase plane spanned by hidden feature



**Fig. 1** Predicted oscillatory cool flame of droplet arrays<sup>1)</sup> (left) and its trajectory on phase space derived by VAE (right)

variables that illustrates the state of nonlinear oscillation, a VAE (Variational Auto-Encoder) consist of a deep neural network is introduced. The first trial of the technique to the oscillating cool flame is presented as well (Fig. 1).

### Acknowledgments

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### References

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