

## Supersonic crowdions and voidions

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**Abstract:** Rapid development of new technologies is often associated with realization of non equilibrium states of materials where new mechanisms of structure evolution different from conventional ones can emerge. One of examples of this phenomenon is formation of crowdions - a particular type of an interstitial defect embedded in a close packed atomic row. It was demonstrated that crowdions can vary by configuration and velocity being able to promote in supersonic and subsonic mode. Compression in part of the crystal naturally initiates the rarefaction in the neighboring zone arousing formation of vacancies and their delocalized variations – voidions able to travel along closely packed crystallographic directions.

The paper presents a state of the art overview on recent advances in the field of crowdion and voidion dynamics in crystals as investigated by means of atomistic simulations.

Presented results can be useful for providing new insight in the analysis of defect rearrangement and accumulation in severely impacted materials.

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