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Do shocks associated with merged interaction regions in the supersonic solar wind survive in the heliosheath?

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Observations of the supersonic solar wind in the outer heliosphere by Voyager 2 exhibit many examples of shocks. During the solar minimum, shocks are usually associated with global structures in the solar wind such as corotating interaction regions. Other transient events in the solar wind such as interplanetary CMEs and merged interaction regions usually occurred during the maximum of solar activity may also drive shocks. As the shocks propagate from the inner to outer heliosphere they evolve in the interaction with the ambient solar wind and in collision and merging processes among each other. We explore the effect of merging of shock pairs in the supersonic solar wind and study the propagation of merged shock pairs in the heliosheath. We use a 3D MHD model of the solar wind interaction with the interstellar medium to generate a couple of shock pairs in the supersonic solar wind with characteristics similar to those observed by Voyager 2 at 45 AU from the Sun and analyze their propagation into the heliosheath. We show that merging of shock pairs do not result in dissipation of shocks; on the contrary, in some cases the shocks may become stronger. From modeling a propagation of a pair of weak shocks from the region upstream the termination shock into the heliosheath we found that several shocks may form in the heliosheath. The absence of shocks in the Voyager 2 plasma data from the heliosheath could indicate that other dissipative processes not included in our model are important in the heliosheath.