

Abstract Submitted  
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**Gas flows through shallow microchannel junctions and networks**

AMIR GAT, ITZCHAK FRANKEL, DANIEL WEIHS, Technion - Israel Institute of Technology — We study creeping compressible (and incompressible) flows through micro-channel networks whose depth is small in comparison with all other dimensions. Making use of an extended Hele-Shaw asymptotic scheme together with conformal mapping we obtain the relation between the mass-flow-rate and the entrance and exit pressures of a T-junction, thereby quantifying the effects of the junction on the pressure field. The linearity of the problem in terms of an appropriately defined quadratic form of the pressure allows us to apply the results for a single junction towards the optimization of (inter-digitated) networks of parallel-micro-channels which include multiple T-junctions.

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