Merits of the RFD Linac Structure for Proton and Light-Ion Acceleration Systems[*], D.A. SWENSON, F.W. GUY, Linac Systems; K.R. CRANDALL, Consult Crandall - The Rf-Focused Drift-tube (RFD) linac structure, under development at Linac Systems, has the high acceleration efficiency of the DTL linac and the strong rf-electric focusing of the RFQ linac. Because of the rf electric focusing, the RFD linac structure operates well at much lower energies than the conventional magnetically focused DTL. Consequently, the transition energy between the RFQ linac, required to capture the unbunched beam from the injector, and the RFD linac can be much lower than for conventional RFQ/DTL combinations. The acceleration efficiency of the RFQ is relatively high, and similar to that of the RFD, at these lower energies. Because of the rf electric focusing in the RFD, the transverse focusing (and beam size) in the RFD is similar to that in the RFQ. Consequently, no complex matching section is required between the two linacs. The consequences of these merits on the cost and complexity of small proton and light-ion linac systems for scientific, medical and industrial applications will be addressed.

* Development supported by the U.S. National Institute of Mental Health (NIMH).