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Osmotically driven pipe flows¹ EMMANUELLE RIO,
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The mechanism for the transport of sugar in plants is a key issue for the
understanding of their growth. Since the 1930'ies the dominant model
has been the so-called Münch model (Münch 1930) where the transport
of sugar in the phloem of plants is viewed as a purely passive hydrody-
namical process. According to Münch, differences in osmotic pressure
caused by differences in sugar concentration create a mean flow, trans-
porting sugar from high concentration regions (e.g. leaves) to low con-
centration regions (e.g. new shoots or roots). We have performed exper-
iments and numerical solutions for such flows under various conditions,
to explore the nature of the ensuing rich fluid dynamics. Experiments
are performed with solutions of dextran of various molecular weights and
in channels of widths ranging from centimetric down to micrometric.

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