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Thomas E Gilsdorf* (thomas_gilsdorf@und.nodak.edu), Department of Mathematics, Grand Forks, ND 58202. *Convenient vector spaces in the locally convex setting*. Preliminary report.

Recent work by Kriegl, Michor and others has allowed widely applicable definitions of nonlinear distributions in the sense of Colombeau. The background in this context occurs in *convenient vector spaces (clcs)*. In the context of locally convex spaces a *clcs* is a locally complete bornological space. Much is already known about both local completeness and bornological spaces, however in this talk we describe a few new results. First, we examine spaces that are webbed, and that are so-called \mathcal{K} - spaces in which every null sequence has a series-convergent subsequence. Webbed spaces need not be bornological nor locally complete, and the same is true of \mathcal{K} - spaces. Our first result is: If a locally convex space is a webbed \mathcal{K} - space in which every sequentially continuous seminorm is continuous, then that space is a *clcs*. We show examples of spaces that are not *clcs* yet satisfy one or two of the above properties. Next, we consider spaces of distributions and local spaces of distributions, studied by Schwartz and Horváth. Examples of such spaces that are or are not *clcs* will be described, and some partial results on characterizing *clcs* in this context will be given. (Received January 30, 2004)