distinct points $x_m \in G$ without limit point in G, such that $\phi_m(x_m) \neq 0$ $(m=1,2,3,\cdots)$. Let W be the set of all $\phi \in C_c^\circ(G)$ that satisfy

$$|\phi(x_m)| < m^{-1} |\phi_m(x_m)| \quad (m=1,2,3,\cdots).$$

Since each K contains only finitely many x_m, it is easy to see that W is open in $C_c^\circ(G)$. Since $\phi_m \notin mW$, no multiple of W contains E. This shows that E is not bounded.

Γ W is open in $C_c^\circ(G)$. $\phi \in W \Rightarrow |\phi(x_m)| < m^{-1}|\phi_m(x_m)|$. $\psi \in N(\phi, \delta) \Rightarrow \|\phi - \psi\|_0 < \delta$. ?

W is not open in $C_c^\circ(G)$ w.r.t $\| \ \|_0$.

We made a mistake in understanding the topology $C_c^\circ(G)$. Let's try it.

$C_c^p(G)$. K compact subset of G.

$\Rightarrow$ $V_N = \{ \varphi \in C^\infty(G) ; \ \|\varphi\|_p < \frac{1}{N} \text{ on } K_N \}$.

where $\|\varphi\|_p < \frac{1}{N}$ on K_N means that $\max\{ |D^\alpha \varphi(x)| ; x \in K_N \}$, and $K_N \subset \mathring{K}_{N+1}$, $\bigcup K_N = G$.

$\{V_N\}$ forms a local convex base for C^p topology.

On $\mathcal{D}_K$, we take the induced topology τ_K.

$\Rightarrow$ β = collection of all convex balanced sets $W \subset C_c^p(G)$ s.t $\mathcal{D}_K \cap W \in \tau_K$ for every compact set $K \subset G$.

Specially $p=0$. $W \cap \mathcal{D}_K$ is open in $\mathcal{D}_K$ for $W \cap \mathcal{D}_K \ni \phi$ $\Rightarrow$ $\phi + \{ \psi \in C_c^\circ(G) ; \|\psi\|_0 < \delta$ on $K_N \supset K \} \subset W \cap \mathcal{D}_K$ $\Rightarrow$ E is not bounded.