Table 1: **Frontends for learnable hybrid ScatterNet.** Frontends used for experiments on CIFAR-10 and CIFAR-100. With the exception of **??** all options have the same output activation size - $147 \times 8 \times 8$. The backend is not shown here for compactness, but matches the convC to conv F backend from **??**.

(a) Reference 1

Layer	Act. Size
convA, $w \in \mathbb{R}^{21\times3\times3\times3}$	$3 \times 32 \times 32$
	$21 \times 32 \times 32$
pool1, max pool 2×2	$21 \times 16 \times 16$
convB, $w \in \mathbb{R}^{147\times21\times3\times3}$	$147 \times 16 \times 16$
pool2, max pool 2×2	$147 \times 8 \times 8$
convC, $w \in \mathbb{R}^{2C\times147\times3\times3}$	$2C \times 8 \times 8$
convD, $w \in \mathbb{R}^{2C\times2C\times3\times3}$	$2C \times 8 \times 8$
convE, $w \in \mathbb{R}^{4C\times2C\times3\times3}$	$4C \times 8 \times 8$
convF, $w \in \mathbb{R}^{4C\times4C\times3\times3}$	$4C \times 8 \times 8$
avg pool 8×8	$4C$
fc1, $4C \times N_c$	N_c

(b) ScatNet A

Layer	Act. Size
scat1, no w	$3 \times 32 \times 32$
	$21 \times 16 \times 16$
scat2, no w	$147 \times 8 \times 8$

(c) ScatNet B

Layer	Act. Size
inv1, $A \in \mathbb{R}^{21\times21}$	$3 \times 32 \times 32$
	$21 \times 16 \times 16$
inv2, $A \in \mathbb{R}^{147\times147}$	$147 \times 8 \times 8$