Digital Integrator in C-code

This report shows how to implement a digital integrator by means of C-code. The simulation was done in PSIM and the C-code was experimentally verified in the DSC TMS320F28335. The simulation file is freely available on https://sites.google.com/site/busarellosmartgrid/material-didatico-didactic-material/Integrator%20in%20C-code.psimsch?attredirects=0&d=1

Fig. 1 presents the simulated circuit containing the integrator in C-code. Each C-code inside the blocks is presented next.

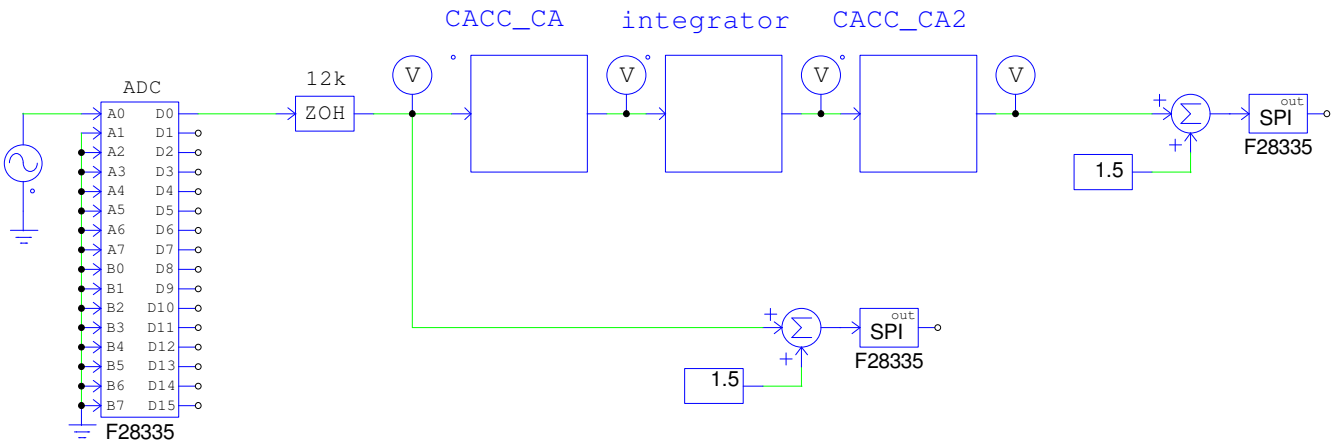

Figure 1: Simulated circuit containing the integrator in C-code.

The following C-code is the block called CCCA_CA and CACC_CA2, both of them used to remove any CC value in the incoming signal.

```
static float soma=0;

static float  valoranterior=0;

soma = 0.999* soma + (x1-valoranterior);

valoranterior= x1;

y1 = soma;
```

The following code is the digital integrator.

```
static float soma=0;

static float  valoranterior=0;

soma = soma + (376.9911184*(0.5/12000))*(x1 +valoranterior);

valoranterior= x1;

y1= soma;
```

Fig. 2 presents the simulated and experimental result for a sinusoidal incoming signal and the integrator output signal.

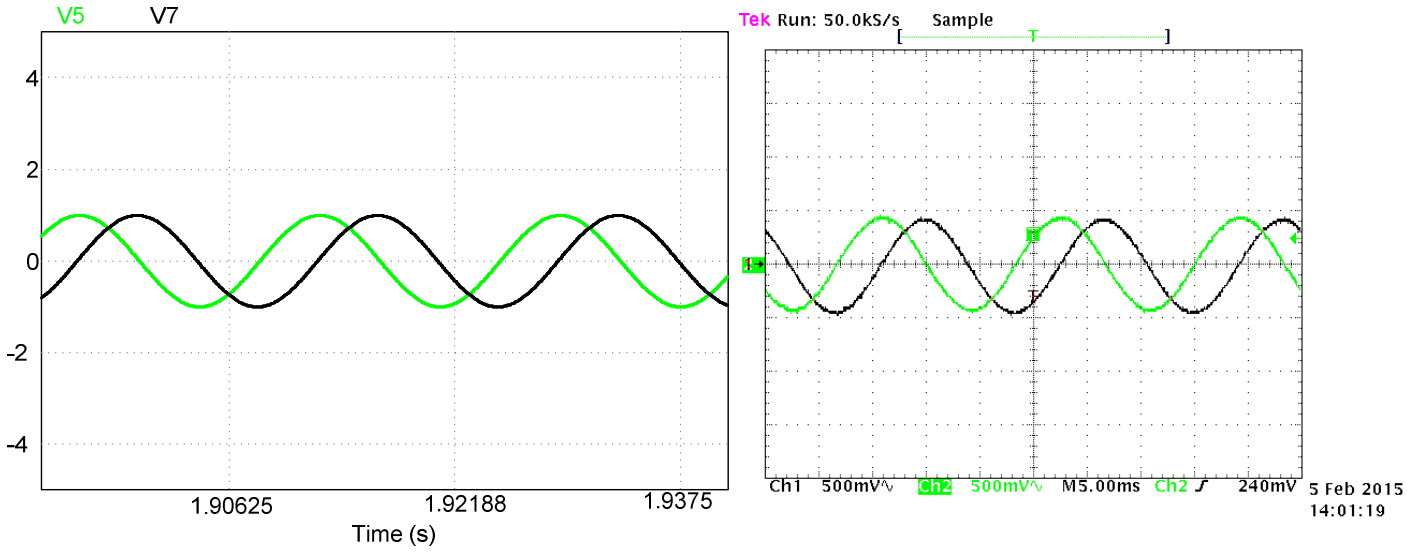

Figure 2: simulated (on the left) and experimental result for a sinusoidal incoming signal (green) and the integrator output signal (black).