使用 TMS320C2812 控制异步电机的程序，采用 SVPWM 空间矢量控制算法，运行正常，加减速，正反转等.

首先，初始化设备，

```
/*初始化系统*/
    InitSysCtrl();

    /*关中断*/
    DINT;
    IER = 0x0000;
    IFR = 0x0000;

    /*初始化PIE控制寄存器*/
    InitPieCtrl();

    /*初始化PIE矢量表*/
    InitPieVectTable();

    /*初始化SCIb寄存器*/
    InitSci();

    /*设置CPU定时器*/
    InitCpuTimers();
    ConfigCpuTimer(&CpuTimer2, 150, 20000);
    StartCpuTimer2();

    /*初始化IO口*/
     InitGpio();

    /*初始化EV*/
    eva.Init(&eva);
    evb.Init(&evb);
```

下步，（个人习惯写个显示程序）

```
void ShowDisp(void)       //显示
{
    static unsigned int i=0;
```

```
switch(i)
{
case 0:
    i++;
    ScibRegs.SCITXBUF =(ku&0xf)+(3<<5);
    break;
case 1:
    if(RunFlag)     ScibRegs.SCITXBUF =23+(2<<5);
    else        ScibRegs.SCITXBUF =24+(2<<5);
    i++;
    break;
case 2:
    if(RunFlag)     ScibRegs.SCITXBUF =f_now/10+(1<<5);
    else            ScibRegs.SCITXBUF =f_given_disp/10+(1<<5);
    i++;
    break;
case 3:
    if(RunFlag)     ScibRegs.SCITXBUF =f_now%10;
    else        ScibRegs.SCITXBUF =f_given_disp%10;
    i=0;
    break;
default:
    i=0;
    break;
}
```

下面再写，各功能模块：

1、 矢量计算和PWM生成

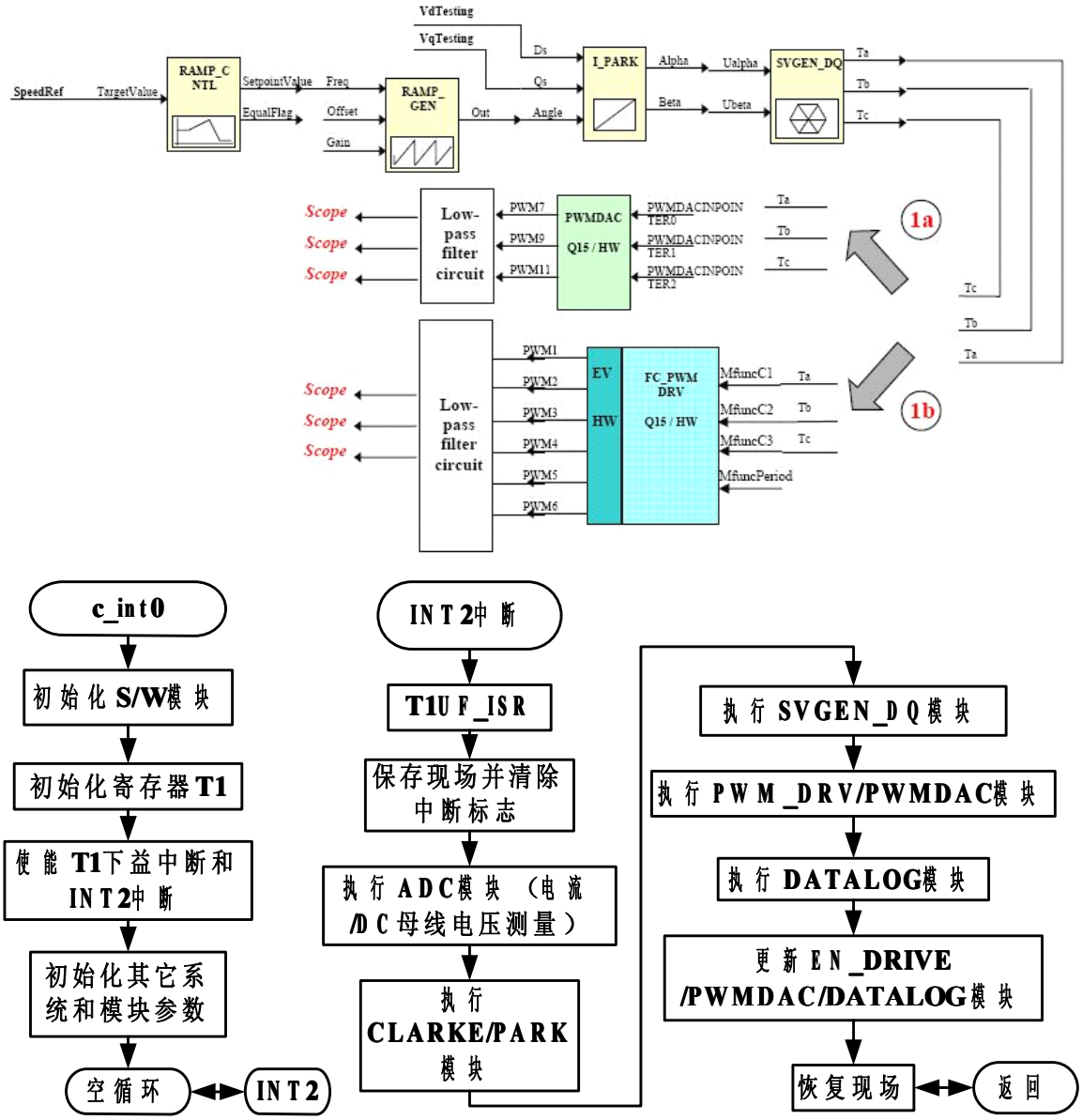
以下给出步骤 1 中的控制参数及其调节范围

EnableFlag：0、1；启停控制位

SpeedRef：（0~0.99）；速度给定值

VdTesting：（0~0.9）；D 轴电流给定

VqTesting：（0~0.9）；Q 轴电流给定




```
void rampgen_calc(RAMPGEN *v)
{

// Compute the angle rate
       v->Angle += _IQmpy(v->StepAngleMax,v->Freq);

// Saturate the angle rate within (-1,1)
       if (v->Angle>_IQ(1.0))
         v->Angle -= _IQ(1.0);
       else if (v->Angle<_IQ(-1.0))
         v->Angle += _IQ(1.0);
```

```
// Compute the ramp output
      v->Out = _IQmpy(v->Angle,v->Gain) + v->Offset;

// Saturate the ramp output within (-1,1)
      if (v->Out>_IQ(1.0))
        v->Out -= _IQ(1.0);
       else if (v->Out<_IQ(-1.0))
        v->Out += _IQ(1.0);

}

void RotateVecotr_calc(RotateVecotr_Handle v)
{
    _iq Ua,Ub;

// Using look-up IQ sine table
    Ub   = _IQsinPU(v->Angle);
    Ua   = _IQcosPU(v->Angle);

    v->Ualpha = _IQmpy(v->k,Ua);
    v->Ubeta  = _IQmpy(v->k,Ub);
}
void scope(void)
{

    long tl,tm,t0;
    tl = svpwm.tl;
    tm = svpwm.tm;
    t0 = ((long)1<<19) - tl - tm;
    switch(svpwm.vect)
        {
            case 2:ua = t0+tm;  ub = t0;              break;
            case 3:ua = 0;      ub = tl;              break;
            case 1:ua = t0;     ub = ((long)1<<19);       break;
            case 5:ua = tl;     ub = tl+tm;           break;
            case 4:ua = ((long)1<<19); ub = tm+t0;    break;
            case 6:ua = tl+tm;     ub = 0;         break;
            default:                                 break;
        }
    uab=ua-ub;
}
```

2、这就是传说中的精华所在：电流、直流母线电压、速度测试

```
void svgendq_calc(SVGENDQ *v)
{

    _iq Va,Vb,Vc,t1,t2;
    unsigned long Sector = 0;  // Sector is treated as Q0 - independently with
global Q

// Inverse clarke transformation
    Va = v->Ubeta;
    Vb = _IQmpy(_IQ(-0.5),v->Ubeta) + _IQmpy(_IQ(0.8660254),v->Ualpha);  //
0.8660254 = sqrt(3)/2
    Vc = _IQmpy(_IQ(-0.5),v->Ubeta) - _IQmpy(_IQ(0.8660254),v->Ualpha);  //
0.8660254 = sqrt(3)/2

// 60 degree Sector determination
    if (Va>_IQ(0))
       Sector = 1;
    if (Vb>_IQ(0))
       Sector = Sector + 2;
    if (Vc>_IQ(0))
       Sector = Sector + 4;

// X,Y,Z (Va,Vb,Vc) calculations
    Va = v->Ubeta;                                                    // X = Va
    Vb = _IQmpy(_IQ(0.5),v->Ubeta) + _IQmpy(_IQ(0.8660254),v->Ualpha);   // Y
= Vb
    Vc = _IQmpy(_IQ(0.5),v->Ubeta) - _IQmpy(_IQ(0.8660254),v->Ualpha);   // Z
= Vc

    if (Sector==0)  // Sector 0: this is special case for (Ualpha,Ubeta) = (0,0)
    {
       v->Ta = _IQ(0.5);
       v->Tb = _IQ(0.5);
       v->Tc = _IQ(0.5);
    }
    if (Sector==1)  // Sector 1: t1=Z and t2=Y (abc ---> Tb,Ta,Tc)
    {
       t1 = Vc;
       t2 = Vb;
       v->Tb = _IQmpy(_IQ(0.5),(_IQ(1)-t1-t2));      // tbon = (1-t1-t2)/2
       v->Ta = v->Tb+t1;                            // taon = tbon+t1
```

```
    v->Tc = v->Ta+t2;                           // tcon = taon+t2
}
else if (Sector==2)  // Sector 2: t1=Y and t2=-X (abc ---> Ta,Tc,Tb)
{
    t1 = Vb;
    t2 = -Va;
    v->Ta = _IQmpy(_IQ(0.5),(_IQ(1)-t1-t2));     // taon = (1-t1-t2)/2
    v->Tc = v->Ta+t1;                           // tcon = taon+t1
    v->Tb = v->Tc+t2;                           // tbon = tcon+t2
}
else if (Sector==3)  // Sector 3: t1=-Z and t2=X (abc ---> Ta,Tb,Tc)
{
    t1 = -Vc;
    t2 = Va;
    v->Ta = _IQmpy(_IQ(0.5),(_IQ(1)-t1-t2));     // taon = (1-t1-t2)/2
    v->Tb = v->Ta+t1;                           // tbon = taon+t1
    v->Tc = v->Tb+t2;                           // tcon = tbon+t2
}
else if (Sector==4)  // Sector 4: t1=-X and t2=Z (abc ---> Tc,Tb,Ta)
{
    t1 = -Va;
    t2 = Vc;
    v->Tc = _IQmpy(_IQ(0.5),(_IQ(1)-t1-t2));     // tcon = (1-t1-t2)/2
    v->Tb = v->Tc+t1;                           // tbon = tcon+t1
    v->Ta = v->Tb+t2;                           // taon = tbon+t2
}
else if (Sector==5)  // Sector 5: t1=X and t2=-Y (abc ---> Tb,Tc,Ta)
{
    t1 = Va;
    t2 = -Vb;
    v->Tb = _IQmpy(_IQ(0.5),(_IQ(1)-t1-t2));     // tbon = (1-t1-t2)/2
    v->Tc = v->Tb+t1;                           // tcon = tbon+t1
    v->Ta = v->Tc+t2;                           // taon = tcon+t2
}
else if (Sector==6)  // Sector 6: t1=-Y and t2=-Z (abc ---> Tc,Ta,Tb)
{
    t1 = -Vb;
    t2 = -Vc;
    v->Tc = _IQmpy(_IQ(0.5),(_IQ(1)-t1-t2));     // tcon = (1-t1-t2)/2
    v->Ta = v->Tc+t1;                           // taon = tcon+t1
    v->Tb = v->Ta+t2;                           // tbon = taon+t2
}
```

3、这个工程还没做完，先上这么多。

4、这块是上面初始化部分的，模块化程序，凑个字数，嘻嘻!!

```
void InitXintf(void)
{

    #if  F2812
    // Example of chaning the timing of XINTF Zones.
    // Note acutal values should be based on the hardware
    // attached to the zone - timings presented here are
    // for example purposes.

    // All Zones:
    // Timing for all zones based on XTIMCLK = SYSCLKOUT
    XintfRegs.XINTCNF2.bit.XTIMCLK = 0x0000;

    // Zone 0:
    // Change write access lead active trail timing
    // When using ready, ACTIVE must be 1 or greater
    // Lead must always be 1 or greater
    // Use timings based on SYSCLKOUT = XTIMCLK
    XintfRegs.XTIMING0.bit.XWRTRAIL = 3;
    XintfRegs.XTIMING0.bit.XWRACTIVE = 7;
    XintfRegs.XTIMING0.bit.XWRLEAD = 3;
    // Do not double lead/active/trail for Zone 0
    XintfRegs.XTIMING0.bit.X2TIMING = 0;

    // Zone 2
    // Ignore XREADY for Zone 2 accesses
    // Change read access lead/active/trail timing
    XintfRegs.XTIMING2.bit.USEREADY = 0;
    XintfRegs.XTIMING2.bit.XRDLEAD = 3;
    XintfRegs.XTIMING2.bit.XWRACTIVE = 7;
    XintfRegs.XTIMING2.bit.XRDTRAIL = 3;
    // Double lead/active/trial timing for Zone 2
    XintfRegs.XTIMING2.bit.X2TIMING = 1;

    // Zone 2 is slow, so add additional BCYC cycles when ever switching
    // from Zone 2 to another Zone.  This will help avoid
    // bus contention.
    XintfRegs.XBANK.bit.BANK = 2;
    XintfRegs.XBANK.bit.BCYC = 3;

    #endif
```

```
}
```

相信对你有帮助的：
TMS320F2812 在电机控制系统的应用

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