

```

1 #ifndef AHRS_H
2 #define AHRS_H
3
4 #include "stm32f4xx_hal.h"
5 // #include "board.h"
6 #include "steval_fcu001_v1.h"
7 #include "quaternion.h"
8
9 #define AHRS_DEBUG          0
10 #define COE_MDPS_TO_RADPS  1.745329252e-5
11 #define COE_RADS_TO_MDPS   (1/(1.745329252e-5))
12 #define NORM_R              0.25
13 #define BIG_R                0.25
14 #define AHRS_P_1            1e-1
15 #define AHRS_P_2            1e-0
16 #define AHRS_Q              1e-4
17 #define ACC_OVER_U          (1.0/1250)
18 #define ACC_OVER_D          (1.0/750)
19
20 // Sampling time of sensors
21 #define SENSOR_SAMPLING_TIME 0.00625
22 // #define gyroMeasError 3.14159265358979 * (10.0f / 180.0f) // gyroscope measurement error
23 // in rad/s (shown as 10 deg/s)
24 // #define beta sqrt(3.0f / 4.0f) * gyroMeasError // compute beta
25 #define alpha                1.0
26 #define BETA_NORM            0.8 //0.15
27 #define BETA_ZERO           0
28 #define zeta                 0.006 //0.003
29 #define AHRS_KP_BIG          10.0 //0.4 is tested, so slow in calibrated.
30 #define AHRS_KP_NORM         0.4
31 #define AHRS_KI              0.1
32
33 typedef struct
34 {
35     QuaternionTypeDef q; // Current altitude
36     float gx, gy, gz; // Current angle rate @ body frame
37 } AHRS_State_TypeDef;
38
39 typedef struct
40 {
41     float gx, gy, gz;
42 } Gyro_Rad;
43
44 void ahrs_fusion_ag(AxesRaw_TypeDef_Float *acc, AxesRaw_TypeDef_Float *gyro,
45 AHRS_State_TypeDef *ahrs);
46 #endif // AHRS_H
47

```

サンプリング時間

比例ゲインの値

積分ゲインの値