

CMAltimeter

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An altimeter in your phone

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Introduced with iPhone 6/6+ (2014)

- And then except for iPhone SE
 - ▶ Observed on such a device
- Works on recent iPad too
 - ▶ Generally speaking, you better test it works

Cass CMAltimeter

- Also in CoreMotion

Goals

- Fetch a relative altitude
- Fetch current pressure

Principle

Create a CMAltimeter

- Check for existence
 - ▶ `isRelativeAltitudeAvailable()`
- Check for authorisation (not mandatory)
 - ▶ `authorizationStatus()`

Start/Stop sampling

```
func startRelativeAltitudeUpdates(to queue: OperationQueue,  
                                  withHandler handler: @escaping CMAltitudeHandler)
```

```
func stopRelativeAltitudeUpdates()
```

- About the handler
 - ▶ `(CMAltitudeData?, Error?) -> Void`
 - ▶ `NSError` in Objective-C

Principle

Create a CMAltimeter

- Check for existence
 - ▶ `isRelativeAltitudeAvailable`
- Check for authorization
 - ▶ `authorizationStatus`



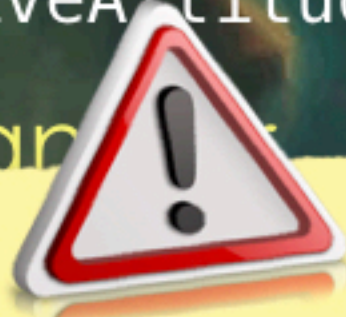
Units!

Pressure in kP, altitude in meters

Start/Stop sampling

```
func startRelativeAltitudeUpdates(to queue: OperationQueue,  
                                  withHandler handler: @escaping CMAltitudeHandler)  
  
func stopRelativeAltitudeUpdates()
```

- About the handler
 - ▶ `CMAltitudeDelegate`
 - ▶ `NSError` in `Objective-C`



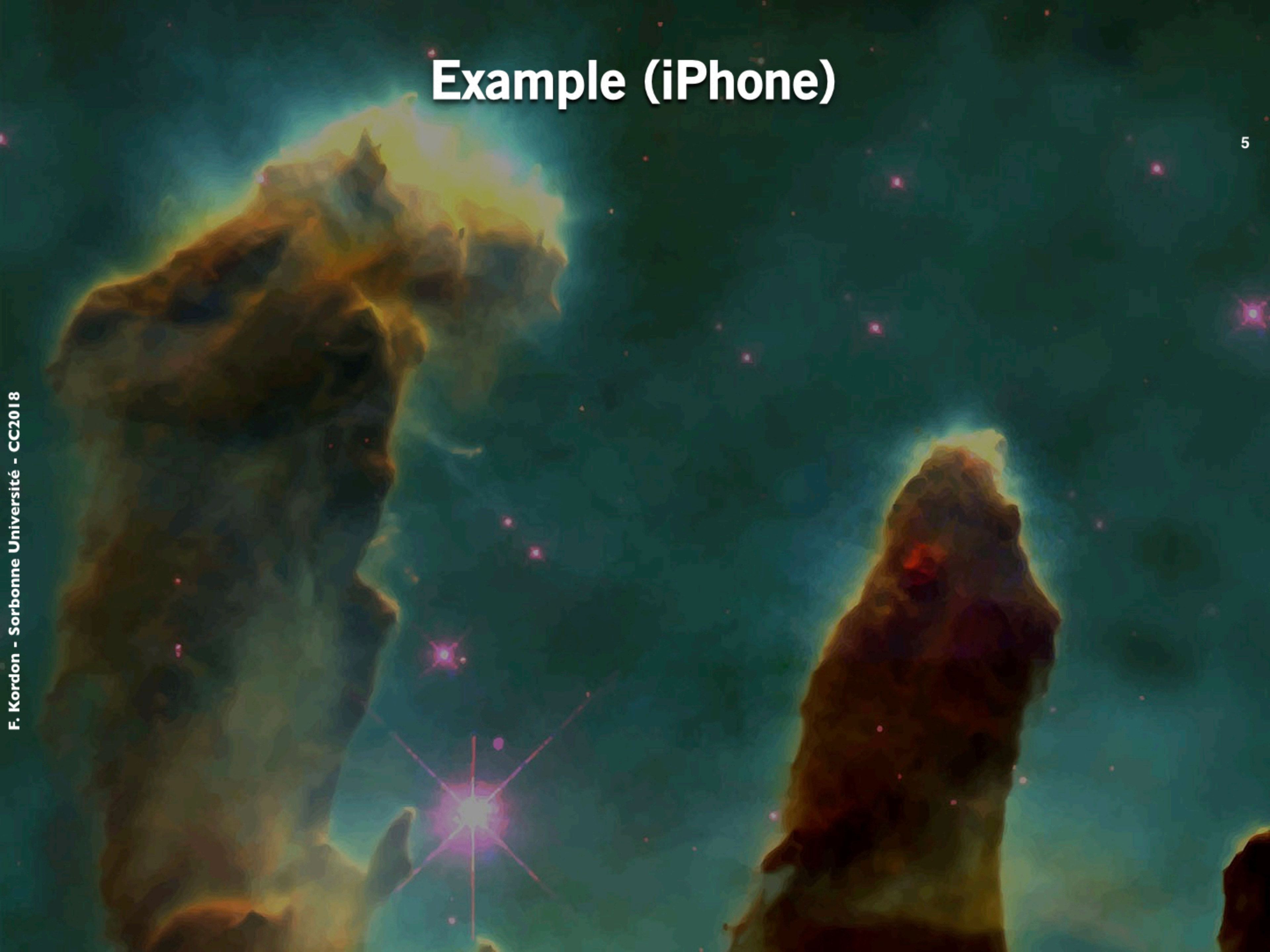
Remember CMMotionManager

Similar to the «first approach»

Example (iPod Touch)



Example (iPhone)



ViewController

```
//  
// ViewController.swift  
// Altimeter  
//  
// Created by Fabrice Kordon on 02/11/2018.  
// Copyright © 2018 Sorbonne Université. All rights reserved.  
//  
  
import UIKit  
  
class ViewController: UIViewController {  
  
    private let v = MyView(frame: UIScreen.main.bounds)  
  
    override func viewDidLoad() {  
        super.viewDidLoad()  
        self.view = v  
    }  
  
    override func viewWillTransition(to size: CGSize,  
                                     with coordinator:  
    UINavigationControllerTransitionCoordinator) {  
        v.displayInSize(size)  
    }  
}
```


MyView

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```
import UIKit
import CoreMotion

class MyView: UIView {

    private let l = UILabel()
    private let b = UIButton(type: .system)
    private let altMngr = CMAltimeter()
    let backg = UIImageView(image: UIImage(named: "mountain"))
```


MyView

```
override init(frame: CGRect) {
    super.init(frame: frame)
    self.backgroundColor = UIColor.black
    backg.alpha = 0.7
    self.addSubview(backg)
    if CMAltimeter.isRelativeAltitudeAvailable() {
        l.text = "----"
        l.textColor = UIColor.white
        l.textAlignment = .center
        b.setTitle("Start", for: .normal)
        b.tintColor = UIColor.white
        b.addTarget(self, action: #selector(startStop), for: .touchDown)
        self.addSubview(b)
    } else {
        l.text = "CMAltimeter unavailable"
        l.textColor = UIColor.white
        l.textAlignment = .center
    }
    self.addSubview(l)
    self.displayInSize(UIScreen.main.bounds.size)
}

required init(coder aDecoder: NSCoder) {
    fatalError("init(coder:) has not been implemented")
}
```


MyView

```
func displayInSize(_ size: CGSize) {
    l.frame = CGRect(x: 20.0, y: 60.0, width: size.width - 40.0, height: 20.0)
    b.frame = CGRect(x: 20.0, y: 160.0, width: size.width - 40.0, height: 20.0)
    backg.center = CGPoint(x: size.width / 2, y: size.height / 2)
}

@objc func startStop () {
    if b.title(for: .normal) == "Stop" {
        b.setTitle("Start", for: .normal)
        altMgr.stopRelativeAltitudeUpdates()
        l.text = "----"
    } else {
        b.setTitle("Stop", for: .normal)
        altMgr.startRelativeAltitudeUpdates(to: OperationQueue.current!,
                                             withHandler: update)
    }
}

func update (d : CMAltitudeData?, e: Error?) {
    l.text = String(format: "%.3f m & %.3f kP",
                    (d?.relativeAltitude.floatValue)!,
                    (d?.pressure.floatValue)!)
}
}
```


As a conclusion...

- 📱 **Easy is'n't it?**
- 📱 **Works on more devices now**
 - 👤 Several ways to get altitude
 - ▶ Including GPS

